THE MARINE RECORD.

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AN AUTOMATIC LIGHT-HOUSE.

The new light-house just completed on an estuary of the Gironde, in France, where it stands upon an isolated rock in the midst of a treacherous and rocky reef, has a very unique feature. The peculiarity is that it is unoccupied, and yet its lamp is burning perpetually. The famous Eddystone light, on the coast of England, rising from a rock that is only large enough to afford a foundation for the structure, is remarkable because the men having it in charge are able to leave their confined quarters only once every three months, when a vessel comes to them with supplies, letters, papers and a new detachment of watchers.

It was to do away with this exacting and lonesome life that the French engineers set themselves about the task of devising a method by which the usefulness of the light-house could be maintained without so much personal attention. It thus happened that a lamp was invented which will burn continuously for two months without being trimmed or replenished.

The burning fluid used in this lamp is an ordinary mineral oil. The tube in the interior of the lamp is furnished with a wick having a thickness three times as great as that employed generally in light-houses. Around the burning surface of the wick is a cake, made of a patented preparation consisting largely of carbonized tar. This protection assures the duration and the uniformity of the flame.

A chimney made of mica is placed around the flame, and this insures an increase in the power of the light. The supply of oil is assured by means of a reservoir containing 100 quarts, the lamp consuming fifty grammes each hour. To provide always for the reservoir being furnished with sufficient fuel, a gauge is fixed at its side that governs the supply flowing in from another reservoir at a distance, and this gauge permits just fifty grammes per hour to percolate through the little supply pipe into the supply reservoir.

The diameter of the lantern is 56 inches and it cost $1,490. The intensity of the light keeps equable until the expiration of two months, when it is necessary to visit the light-house and replenish the wick. The light can be seen more than twelve miles at sea. The wick is cleansed and drawn up gradually by the action of the tar cake at its mouth.

The French government is arranging to put up others of these houses, and it is also perfecting an invention by which a perpetual electric light can be controlled by wires running through a submarine cable to the land.

A MINING RECEIVERSHIP.

On Thursday last the Penokee and Gogebic Consolidated Mining Co. was placed in the hands of Howard Morris, of Milwaukee, and C. F. Rand, of New York, as receivers of the property. The company controlled the Colby, Palms, Tilden, Comet and the Superior mines, with a total annual capacity for producing 800,000 gross tons. The mines shipped last year only between two and three hundred thousand tons, owing to the limited demand for the product. There is now on hand about half a million tons of the ore at the mines. The company is capitalized at $6,000,000, and the immediate cause for the receivership was the threatened foreclosure of a mortgage for $1,000,000, held by the Farmers' Loan and Trust Co., of New York, and others, the proceedings having already begun at Madison, Wis. A report that the company owned large interests in the Ashland and Aurora mines is not true. The Aurora, which is one of the finest properties in the Lake Superior region, its product being always certain of a market at a good figure, and often being sold before any other deals are accomplished, is owned by the Aurora Mining Co., in which Joseph L. and Charles L. Colby are both interested, which fact gave rise to this rumor.

It transpires that all the surplus ore in stock at the mine was sold about two weeks ago to Earl W. Oglesby, the wealthy New York broker, for a figure that does not, it is said, cover the cost of production. The amount sold aggregates about 185,000 tons, for which $1.50 was received, including 30 cents royalty. The cash consideration was $216,580.80.

The ownership of the bonded indebtedness and all but a small amount of scattering stock of the Penokee and Gogebic Consolidated mines has long been vested in eastern capitalists to whom the present depression of the ore market and the consequent shutting down of the mines affords an opportunity which has for some time been under consideration, to thoroughly reorganize the corporation known as the Penokee & Gogebic Consolidated Mines and to establish it on a basis conformable to the changed condition of the trade. A new company called the Penokee Iron Mining Co., has been organized for the purpose of acquiring some or all of the properties in question on terms which will protect the rights and equities of all the interested parties.

LAST SEASON'S LOSSES.

Various estimates of the business done on the lakes by the insurance companies have been made. Here is an estimate from Buffalo, which is based on information that is of the best: Hull premiums aggregated about $1,500,000 and cargo premiums $500,000. The losses were close to $2,500,000, which includes $100,000 or upwards of uninsured interests, the companies losing the rest. Local experience goes to show that a small profit was made on hulls and that the cargo losses were enough to wipe this out and create a loss. Add to the loss reckoned through the insurance companies, the 57 vessels and 123 lives and the season is given in figures the bad name it deserves in fact, without any reference to the unsatisfactory earnings.

The loss on the hull of the steamer Pridgeon has been fixed at about $5,400. The cargo loss will be somewhere between $15,000 and $20 000. The exact figures have not been made up yet. The loss on the Livingstone, which got caught with her flour cargo in the ice below Detroit, will be about $5,000 on the cargo. The hull loss is comparatively small.

THE RISE AND FALL OF TIDES.

Statistics regarding the tides in the Bay of Fundy are so startling as to seem almost incredible. At Grand Manan the fall is from 12 to 15 feet, at Lubec and Eastport 20 feet, at St. John from 24 to 30 feet, at Moncton, on the bend of the Petitcodiac, 70 feet, while the distance between high and low water mark on the Cobequid River is 12 miles, the river actually being 12 miles longer at high than at low water. Vessels can be run up so far on the flood in this river and in the Avon that the ebb will leave them high and dry for 16 hours, so that they can be repaired between tides.

GREAT NORTHERN TERMINALS.

It is now announced by those who claim to know, that an improved dock frontage at the foot of 5th Avenue, west, in Duluth, has been bought for the Great Northern, and this will be the terminal point of its passenger steamers. This spot is less than 1,000 feet from the union station and can be reached by the Great Northern's passenger trains, the idea being to save time and do away with transferring through passengers.

MRS. CARNEGIE'S NEW YACHT.

At the February meeting of the New York Yacht Club members of that organization will have an opportunity to vote on the first application ever made by a woman for admission to the club. The applicant is the widow of Thomas M. Carnegie, of Pittsburg, Pa. Mrs. Carnegie is an enthusiast in yachting, and has always a fleet of boats at the wharf of her winter home on Cumberland Island, off the southern coast of Georgia. She is now having built at the yards of the Maryland Steel Co., at Baltimore, a steel steam yacht. It is to be called Dungenesse, which is the name given to her winter home on the coast of Georgia.

The new yacht was designed by George B. Mallory, and is 135 feet long over the bowsprit, 119 feet over the rail and 101 feet on the seven-foot water line. She has a long overhang aft, and forward has a beautiful clipper stem terminating in an eagle's head. The effect of this will be enhanced by carved trail boards. The beam is 20 feet and the molded depth 10 feet 3 inches. The draught of water will be about 5½ feet forward and 7½ feet aft, displacing 191 gross tons.

The hull is built of steel throughout. The frames are spaced 20 inches and doubled in thickness under machinery spaces and at all the water-tight bulkheads, of which there are four. Steel reverse frames are riveted to every frame and extend to the deck and to floorheads alternately. Seven keelsons are carried through the vessel. The outside plating is five-sixteenths of an inch thick, tapering at the ends. The sheer streak is three-eighths of an inch thick and is carried up to the rail in one width, giving the effect of flush plating to the top side.

Below the main deck, which is of choice white pine, are the main saloon and the owner's stateroom forward and the quarters of the officers and crew aft. The finish of the saloon and owner's room is in ivory white and gold. From the saloon a roomy staircase ascends to the deckhouse. This house is of mahogany. At its after end are a stateroom, bathroom and closets. There will be no pilot house, and the vessel will be steered from the top of the deckhouse. All the woodwork about the deck is mahogany and all the metal work is brass or galvanized iron.

The machinery will consist of a Scotch boiler 10½ feet in diameter and 10 feet long. This will have two 38-inch furnaces, aggregating 38 square feet of grate. The working pressure will be 125 pounds to the square inch. The engine is of the compound type, with cylinders 13 and 24 inches by 18 inches stroke of piston, designed to run at 180 revolutions. It is fitted with steam reversing gear and with surface condenser and independent centrifugal circulating pump. The yacht will also have independent donkey, feed, fire and sanitary pumps. She will be fitted with a distiller capable of supplying ample quantities of fresh water. There will also be a donkey boiler for heating the vessel and running the auxiliaries when there is no steam in the main boiler. The new boat is nearly ready for launching.

A CANADIAN SUIT IN ADMIRALTY.

In the Maritime Court of Ontario, Judge McDougall will try an interesting case at Windsor on January 26. The proceedings are brought against the American vessel E. C. Oggel. Last fall the vessel and its cargo were seized for illegal fishing in Canadian waters. The fish, consisting of 500 pounds of herring and 75 pounds of whitefish, were given to charity. Now the owners of the vessel must defend an action of condemnation and forfeiture.

NEWS AROUND THE LAKES.

CLEVELAND, O.

Mr. Fred Gordon, of Buffalo was a visitor at the Globe Shipyard Thursday.

The Cleveland Shipbuilding Co., is just finishing an engine for an electric railway company in Cincinnati.

The annual meeting of the Wilson Transit Co. was held at Wyckliffe Wednesday. The old officers and directors were re-elected.

The meeting at Rockport of the Richardson Transportation Co., which was set for Wednesday, has been postponed until the 24th.

The Cleveland and Buffalo Transit Co. will hold its annual meeting on Tuesday, Feb. 6, at Congressman W. J. White's suburban home, west of Rocky River.

The Perry-Payne building is receiving a thorough renovating of its interior, including some fresh paint. Considerable light is added by the removal of the dust of ages from the skylights. A score of vessel masters who have nothing else to do just now are supervising the work.

The steamer Colonial has not yet received her repairs but is waiting at the Ship Owners' dry dock, ready to enter the inside basin as soon as her insurance is adjusted. The delay in this is due, not to differences, but to a press of other business on the part of one of the adjusters.

The work on the steamer North America, at the Globe yard, is making some progress, although as yet no precise time has been set for launching. The hull has been plated for a long time, and the work at present is upon the boiler houses. The heavier parts of the engine are being made at the Globe Iron Works, and work on the boilers is being pushed forward as rapidly as possible.

Among the Cleveland members of the Lake Carriers' Association who went to Detroit to take part in the annual meeting this week were president Thomas Wilson, James and John Corrigan, M. A. Bradley, J. C. Gilchrist, John H. Palmer, J. T. Hutchinson, John W. Moore, H. A. Hawgood, W. A. Hawgood, H. G. Dalton, treasurer George P. McKay, W. S. Mack, John and Alf. Mitchell, J. H. Sheadle, B. L. Pennington, and Harvey D. Goulder, general counsel.

Col. Jared A. Smith, United States Engineer, has drawn plans for the construction of a light-house at Braddock's Point, Lake Ontario. The tower is precisely similar in form and dimensions to the tower at the corner of Water and Main streets, where the light has been discontinued. The Colonel's object in this is to make use of the interior winding stair, the lantern and the iron balcony around the light, in the new tower on Lake Ontario.

As soon as the hull of the new fire boat is launched, another wooden tug will be constructed in the same place on the bank of the old river bed, by the Standard Contracting Co. She will be 65 feet in length, with 13 feet beam and 6 feet depth. Steam will be furnished from a tubular boiler, and she will have double high pressure engines with cylinders 9½ by 10 inches. She is to be built to take care of and stand by the company's pile drivers and for towing them from place to place, but she will be handsomely finished and will take out a passenger license, as her owners expect to use her on occasion as a pleasure craft.

A surprising amount of work has been done on the Northern line passenger steamship Northwest since her launch. She is now under the immense shear legs at the Globe shipyard, receiving her heavy machinery. The entire engine bed has been placed in position, and the supporting columns of the big engines are in place. The forward battery of boilers is being placed in position very rapidly, and the wood workers have made wonderful changes in the interior since the launch. The fine lines of the great steamer make her look like an immense yacht as she sits in the water, and she is bound to present a beautiful appearance when placed in commission.

The engine of the new freight boat which the Globe Co., intends to build has been decided upon. It will be of the Globe triple expansion type, with cylinders 24, 39, and 63 inches in diameter, by 24 inches stroke of piston. Steam will be furnished from two Scotch type boilers, 16 feet in diameter by 12 in length, with a shell 1¼ inches in thickness. Each boiler will be heated from four furnaces. The hull plating for this boat and the three tugs which the company is to build for L. P. and J. A. Smith, has been ordered from the Carnegie Steel Co., limited, of Pittsburg, and the angles from the Cleveland Rolling Mill Co. The largest of the three tugs is now being laid down.

The work on the hull of the steamer C. B. Lockwood continues at the Ship Owners' Dry dock, and the boat is likely to remain in the dock for three weeks yet, as the owners are sparing no expense in the work of making her ready for sea again. She is receiving a large amount of new planking, even her bulwarks being replaced by four-inch planking, which are edge-bolted together. This is made possible by the fact that the Lockwood's frames extend up to her rail. The boat is being re-fastened and re-calked throughout, and her steel arches are being re-fastened with larger bolts than were in before. Two new steel keelsons are being put in and all this with the extensive repairs at her stem and stern made necessary by the collisions which she experienced before and after she went on the bottom, make her repair bill run up to $25,000 or $30,000. The contract for repairing her engine has not yet been let.

CHICAGO, ILL.

Special Correspondence to The Marine Record.

The V. O. T. Co.'s annual meeting for the appointment of officers was held Saturday morning, J. L. Higgie was chosen president; Jesse Spaulding vice-president; John Whitbeck, treasurer; James Higgie Jr., secretary; Noble Higgie, superintendent.

The annual meeting of the Owen Line was held on January 10, for the settling up of last year's business and electing officers for the ensuing year. Parks Foster was elected president; W. R. Owen, treasurer and general manager; D. F. Webster, secretary.

Capt. G. H. Mohlman is giving the schooner Jesse Phillips some new stanchions new stringers, inside and outside, new rail all around and a new windlass.

The schooner J. C. Fitzpatrick has had her topsides and deck recalked.

The steamer Canisteo is receiving some overhauling and recalking.

C. Counselman is building an elevator at South Chicago, with capacity for 1,500,000 bushels of grain. It is supposed that when completed it will be the largest and best equipped elevator, as to machinery, etc., in the world.

At Miller Brothers' shipyard the steamer Lycoming is in dock receiving some new plank on bottom, new wall strakes, and re-calking.

Capt. Thos. Wilson, shipowner of Cleveland, was in this city Saturday.

P. H. Fleming arrived home from Cleveland last week with flying colors, he having come off the victor in the case of the Schuylkill versus the tug Dan Connelly.

WILLIAMS.

BUFFALO, N. Y.

Special Correspondence to The Marine Record.

Mr. Frank W. Hawley, who had charge of the canal electric experiments near Rochester in December last, will ask permission of the superintendent of public works to operate his boat on the state waterways next season as a sort of object lesson in the uses of electricity. He proposed to have a new boat of the most approved pattern, equipped with a propeller wheel of the latest design, and in place of the trolley used in the experiments already mentioned, proposes to use storage batteries to operate the Westinghouse motors that drive the shaft to which the wheel is attached. Two series of storage batteries will be used.

Capt. Lawrence Green has brought suit in the Superior Court against the Northern Steamship Co. for alleged violation of contract. Capt. Green claims that on November 6th, 1891, he was engaged by one of the company to serve as master on one of its steamers for the season of 1892, but when he offered to begin his duties at the opening of that season, or on March 7, the defendant refused to stand by its agreement. He says he was promised $1,400 and his board by the company, and thinks he was damaged to the extent of $1,800, which he is now trying to recover.

GRAIN MOVEMENT AT CHICAGO.

Special Correspondence to The Marine Record.

The steamer Ira H. Owen was chartered for oats to Buffalo at 2 cents. The tugs Brown and Barry towed her to an elevator Tuesday.

The barge Verona, which was chartered by W. M. Eagan about two weeks ago for 45,000 bushels of wheat for Buffalo, was on Tuesday towed by the tugs Helen and Protection to the Santa Fe elevator to load.

The steamer Neosho, chartered this week for 80,000 bushels of corn at 2½ cents to Buffalo, by W. M. Eagan, was towed to the Rock Island elevator to load, by the tugs Protection and Helen.

The steamer Siberia, chartered for 72,000 bushels of corn to Buffalo at 2½ cents by William Egan this week. was towed by Dunham's tugs to the Indiana elevator on Tuesday.

The steamer Onoko, chartered by Capt. John Prindeville this week for corn to Buffalo at 2½ cents, was towed on Monday to Armour's elevator house.

The steamer Everett, chartered this week by Capt. John Prindiville for 50,000 bushels corn to Kingston or Ogdensburg, was towed to the Central elevator Tuesday by the V. O. T. tugs Helen and Protection.

The steamer Arizona and schooners Scotia and Plymouth were chartered Tuesday for corn to Kingston by J. J. Rardon.

Grain freights this week are quoted at 2½ cents on corn to Buffalo and 3¾ cents on corn to Kingston. The schooners James G. Blaine and A. Mosher were chartered last week for oats to Sarnia at 2 cents.

AN ECONOMY CONFERENCE.

Special Correspondence to The Marine Record.

CHICAGO, Jan. 17.—There was a large attendance at the Vessel Owners and Masters' Association meeting Wednesday afternoon, at their rooms, 252 South Water street. Capt. Thos. Clark, president, was called to the chair and committees were appointed to make arrangements for a general meeting at which vessel owners of both steam and sail vessels will be requested to attend for the purpose of regulating the running expenses of their vessels for the coming season. The meeting is called for February 5th, which all vessel owners and masters are invited to attend, as the question to be discussed and decided upon will be of vital importance to all interested in marine business. Secretary William Wilson will be glad to give any information to persons making inquiries.

FLOTSAM, JETSAM AND LAGAN.

people whom it was sought to enjoin were 800 to 900 feet from the complainant's twine.

The F. & P. M. steamer No. 5 on Lake Michigan has been temporarily laid up on account of lack of business. It is probable that the Nos. 1 and 2 will also be laid up if the dullness continues.

Capt. McDougall left Superior on Saturday for New York. He remarked before starting: "I am going to raise money, if possible, to start the shipyards, and bring it back with me. I will return next Saturday."

Otto Schuneman, a Chicago wood and coal dealer, has purchased the schooner Mediator at sheriff's sale for $4,350. A year ago $3,500 was spent in reconstructing the vessel.

The Thousand Island Steamboat Co. is said to be negotiating for the purchase of two large electric searchlights for the steamers Empire State and St. Lawrence. They will be the most powerful by far ever seen on the St. Lawrence river.

Calvin's new tug, Reginald, was launched off Garden Island, Lake Ontario, early this week. She is 108 feet over all, with a 71 feet 4 inch beam. The boiler was built by Inglis, of Toronto, and the engine, 1,800 horsepower, was built on Garden Island. She is a strong boat, and intended for wrecking and towing.

A case of considerable interest to pound net fishermen was decided by the Circuit Court at Ottawa, O., last week. It was a suit which B. F. Dwelle, of Sandusky, brought against Bertsch & Moore to restrain them from setting their nets in proximity and parallel to his. The court sustained the Common Pleas Court's decision that no person can be restrained from setting nets at any point in Lake Erie so long as they do not get so close as to actually interfere with the operating of the nets of others. The claim, among other things, that damage had been committed by cutting off the free run of fish was held to be of no force. In this case the nets of the

The schooner Mabel Wilson was towed from Kelley's Island to Sandusky by the tugs Welcome and John E. Monk in December, 1890. Upon reaching a point near the mouth of the channel outside of the harbor, it was found that the water was too low to enter on account of a stiff breeze which had been blowing out from the bay. The Wilson stranded on a bar. The water continued to go lower, after which the weather turned cold, and the schooner could not enter port for some time on account of the ice. The owners of the schooner, P. J. Ralph and others, have brought suit against the tugs for damages, and the case is now on trial before Judge Ricks, of Cleveland, in the United States court.

One of the handsomest and most elaborate calendars of the season is that issued by the Hazard Manufacturing Co., manufacturers of galvanized wire rope. The calendar each month presents to view a beautifully finished steel engraving of the finest racing yachts of the Atlantic, the America, Vigilant, Valkyrie, Volunteer, Thistle, Mayflower, Galatea, Puritan, Genesta, Jubilee, Emerald, and Colonia.

The East End Boiler Works, of Detroit, are among the few concerns in the country which are blessed with plenty of orders, being fully supplied with work for the winter and spring. They are building the three boilers and the necessary sheet iron connections for light-vessel No. 58, now building at Craig & Sons yards in Toledo. They are also constructing a water-tube marine boiler for the Finlayson Boiler Co., and are doing considerable new work for the Frontier Iron Works, besides the usual repairs to steamers in winter quarters here.

LAKE CARRIERS' ASSOCIATION.

To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interest of Lake Carriers, and improve the character of the service rendered to the public.

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J. T. Hutchinson,	Cleveland, Ohio.	W. M. Egan,	Chicago, Ill.
A. A. Parker,	Detroit, Mich.		

THE LAKE CARRIERS' ANNUAL.

There was a large and enthusiastic gathering of vessel owners at the annual meeting of the Lake Carriers' Association held at Detroit this week. There were about two hundred present, representing the heaviest of the individual owners and companies carrying coarse freight. The package freight carriers were not well represented. As had been generally understood, Mr. James Corrigan was elected president of the association by a unanimous vote. A new list of vice presidents was chosen, the number being increased to ten, as follows: H. A. Hawgood, Cleveland; Washington Bullard, Buffalo; E. M. Peck, Detroit; J. S. Dunham, Chicago; A. B. Wolvin, Duluth; David Vance, Milwaukee; George G. Hadley, Toledo; C. A. Eddy, Bay City; James McBrier, Erie; and T. J. Firth, Philadelphia. Fifteen more members were added to the board of managers, increasing the whole number to sixty-three, and the new members were chosen from the various ports around the lakes. The standing committees were allowed to remain much the same, the revised list in full being given above. A new committee was formed to look after insurance matters.

The report of Secretary Keep was one of the first things on the programme. The secretary stated that the tonnage enrolled this year amounted 606,205, as compared with 579,919 at his last annual report. The number of vessels enrolled is 612, of which 384 are steamers and 228 schooners or barges. The average tonnage of these is almost exactly 1,000 net. There are comparatively few of the larger boats which are not on the roll of the association, there being one fleet at Detroit and another at Milwaukee. A fair increase is expected next season from tonnage which came out so late last year that it was not deemed worth while to register them in the association. The secretary reviewed briefly the work of the association during the past year, dwelling especially on the influence exerted by the association in securing legislation providing for dredging out Collision Bend, in the Sault, the Canadian retaliation act, with reference to canal tolls; the wrecking reciprocity act; and the Harter bill preventing the liability for damage to cargo by stress of weather when the owner of a boat has done everything possible in making vessels seaworthy and in properly manning and equipping them. The action of the association managers in seeking government regulation of raft towing was reviewed, as well as the amendments to rules governing the passing of vessels, formulated by the association, and subsequently adopted by the Treasury Department.

The secretary alluded to the prompt payment of dues notwithstanding the unsatisfactory earnings of vessels, only about $850 remaining unpaid on the books. Of this, the larger part was promised early payment. During the year $5,915 had been paid for maintaining private lights in the Detroit and St. Clair rivers. This was an increase over the preceding year. The government lights will be in position next year, however, and the association will save fully $3,000. The deficit at the opening of navigation in 1894 will be much smaller than that of 1893, when the board of managers were obliged to borrow $2,500 from a Cleveland bank to meet current expenses in anticipation of the year's dues. Shipping officers were mantained during the year at Buffalo, Ashtabula, Cleveland, Chicago, Escanaba and Toledo. They placed on vessels of the association during the year 11,839 men.

The treasurer's report showed that the receipts for the year were $26,743.07 and disbursements $26,590.44. Treasurer McKay announced that the deficit was only one-half what it was at the opening of the year. He also announced in connection with his report that the case against Shipping Master Felt at Chicago, who was indicted for murder, had been entirely settled and Felt discharged.

Gen. O. M. Poe congratulated the association upon its growth and hoped the business next season would be sufficient to entirely offset the poor business of the past season.

Supt. E. S. Wheeler of the Sault canal, read a report of the business done at his office. It was replete with statistical information, showing the prevailing rates of the past season. Mr. Wheeler said he was sorry his statistics were not more complete, and urged the cooperation of the owners and masters in this work.

One of the first measures of importance enacted by the association was the adoption of a uniform bill of lading, which, while it did not provide for as much as some of the more radical desired, is still calculated to ameliorate in a great measure the disadvantages to which grain carriers have in many instances been subject of late years. The so-called "cut-throat" clause could not be eliminated, but it was provided that if boats were held for shortages they should also be credited with overruns. The only real change is that requiring that the grain shall be delivered at accessible elevators only, so that next season elevator men desiring boats to go to Black Rock with their cargoes will have to make especial arrangement. Secretary Keep was instructed to have the new form printed, and to distribute copies among the members.

After two hours' discussion on Wednesday, the annual tonnage dues of the association were reduced from four to three cents. The members hope this will attract enough more tonnage to prevent any serious falling off in the annual receipts of the association, and the cut was considered by most to be only in consonance with the reduction in all expenses so prevalent at this time. If the funds do not hold out the shipping masters and their clerks will probably have to work on smaller salaries.

Capt. W. S. Mack, of Cleveland, introduced on Wednesday the resolution advocating the appointment of a standing committee on insurance, whose duty it should be to confer from time to time with the Inland Lloyds, and to report to the finance committee. The idea met with general favor, and the resolution carried, the president announcing that the committee would be appointed later. In this connection a communication was read from the American Shipmasters' Association, of New York, who issue the Register of American and Foreign Shipping, asking for recognition by the association. This letter evoked some discussion, but was referred to the committee on insurance.

THURSDAY'S SESSION.

The most important part of the work Thursday was accomplished after the session adjourned. The all-absorbing subject of lake freights—how to improve the rates and prevent demoralization—was left to a committee with full power to act, this committee being appointed at Thursday afternoon's session and consisting of Messrs. M. A. Bradley, A. A. Parker, J. S. Dunham, Thomas Wilson, David Vance, Edward Smith, William Livingstone, Jr., and H. A. Hawgood. The committee set to work after adjournment, and at 11 o'clock Thursday evening had evolved a plan which virtually provides for retiring from the lake trade one-fourth of the grain, coal and ore tonnage for the season. This plan is that one-eighth shall not be placed in commission at all, and that the remainder shall be retired at such time in the season as the circumstances demand. The members of the committee will circulate the agreement in the respective localities, and will not relax their endeavors until they have obtained the signatures of the controlling ownership of 90 per cent. of the tonnage affected, at which time the agreement will become effective when approved by a general meeting of the association, which will be called during the latter part of February.

Several interesting plans were laid before the meeting in the course of Thursday morning's session, in the way of theories for keeping up freights, and while none of them were adopted, they are worth outlining. Capt. J. S. Dunham, of Chicago, submitted an elaborate plan providing for the establishment of agencies at all the chief shipping and receiving ports, and that all the association boats entering port should be listed with the agent on arrival. Captains should be at liberty to accept or reject cargoes offered at less than minimum rates, to be established at a meeting of the joint agents. The Lake Carriers' agent should be free, however, to meet outside rates in case it would prevent an outside boat gaining an advantage over an association boat.

The establishment of a set of minimum rates, which has been talked over somewhat, did not seem to meet the approval of the association, probably because of a fear that a system of rebates would neutralize its effect. The plan nearest the one ultimately adopted was introduced by H. D. Goulder, who, however, explained that it was not original. This plan was to have one-half the vessels owned or controlled by the members of the association start out on May 1st, and the other half on June 1st, except that a man with but one boat should start out May 15th. Minimum rates should be agreed upon, which every member should bind himself to live up to until August, after, which, as the saying is, "the devil take the hindmost." The plan finally adopted appears to have its foundation upon figures submitted to the association by Mr. H. A. Hawgood, by which he demonstrated that there was business last year for 80 per cent. of all the tonnage.

The committee on insurance reported that they had conferred with the committee of the Inland Lloyds and the American Shipmasters' Association, and asked permission to renew last season's arrangement with the Inland Lloyds, which was given.

Capt. W. S. Mack called attention to the fact that while there is a good harbor of refuge at Grand Marais, it is inaccessible at night owing to the lack of range lights. The matter was referred to the committee on navigation.

A telegram from H. G. Dalton, of Cleveland, asking that the association indorse a request for an outer breakwater at Ashtabula, was referred to the committee on legislation. This committee, with that on aids to navigation, were instructed to work to secure the insertion, in the river and harbor bill, of an appropriation for widening the channel at the Limekiln crossing, Detroit river, to 600 feet.

Messrs. J. C. Gilchrist, W. S. Mack, James Millen, H. A. Hawgood; John G. Keith and James Brown, constituting the committee to whom was referred the task of forming an improved bill of lading on coal returned a form which provided that cargoes would be delivered only at docks having fair loading facilities, and depth of water equal to the depth of water at the ordinary draft at the principal docks at that port.

Committees were appointed to obtain a reduction in the charge of four cents a ton for ore trimming; for a reduction in the price of unloading ore; for lower charges at elevators, and for lower dry dock charges.

NOTES.

An interesting paper on the influence of the opened Nicaragua canal on lake carriers.

Mr. James Corrigan, the newly elected president, presided over Thursday's sessions.

The Detroit *Tribune* dubs Capt. Mack "the clarion-voiced orator of the Association."

The members of the association, upon invitation of William Livingstone, Jr., witnessed a stirring war drama at the Detroit Opera House Wednesday evening.

Secretary Keep has been instructed to take the necessary measures for incorporating the association.

THE first number for the year of the Penberthy Bulletin, issued by the Penberthy Injector Co., Detroit, Mich., is an attractive little sheet, containing several interesting articles. It is furnished free to any engineer sending his address.

THE CENTURY CO., 33 East 17th street, New York, have just issued "Pudd'nhead Wilson's Calendar for 1894," containing humorous extracts from Mark Twain's latest story, "Pudd'nhead Wilson," now appearing in *The Century*. They offer to send a copy of the calendar free to any one who will inclose them a stamp to pay postage.

THE LIGHTHOUSE.

No home of pleasure or dear household days,
But a bleak tower whose single beauty lies
In the bright flame piercing the murky skies,
And lighting far off seamen on their ways.
Shaken by rain or storm that madly plays
About the rough-hewn stones; where breakers rise and toss
Their foaming crests, as horse that hies
To the far goal, or shaggy hound that bays
At castle gate and would an entrance win.
There are a few such brave, beleagured souls
Who bear a beacon light, and hear the din
Of a great strife below, and the winds oft
Would ruthless beat them down, but the wave rolls
And breaks—leaving their steadfast flame aloft.

—*B. L. Tollemache in Academy.*

THE SHIPMASTER AND MARINE ENGINEERS.

Where the engineers make, we think, a profound mistake, is in regarding the shipmaster as a seaman set over them. They conclude that this implies a deference by the engineering profession to the more important profession of navigation. As a matter of fact, the shipmasters deals with the engineers in quite another capacity, viz., as a representative of the owner. It is the master's duty, not as a seaman or a navigator, but as a faithful steward of his employer, to see that the engineers perform their duty just as any other members of the crew. No doubt a clerk could do this as well as a navigator. As we say, law and custom have entrusted this duty to the principal seaman, and we must say that shipmasters as a body render good service. Owners, at least respectable owners, do not appoint any seaman as master, they endeavor to obtain trustworthy and steady men for the position; these men are invested by the law with very extensive powers, not because they are seamen or navigators, but because it is necessary in every community to have a representative of the law. Engineers are not so regarded, and, although they and shipmasters come from the same class of society and are as regards education on the same footing, it is only proper and fitting that the shipmasters should hold the superior position, not, again, because they are seamen or navigators, but because they represent the owners and the law.

After all, the question is largely one for shipowners. At present a steamer requires two professions to get her along. If the seaman could also be an engineer, or vice versa, the cost of working a vessel would be much reduced, and the vessel would be very much more efficient as a machine. Under the double regime mistakes and expense are unavoidable, owing to the division of responsibility and also to mutual jealousy. On the other hand, shipowners are afraid of educated men; this is shown by their refusal to support higher technical education for ships' officers, and also by their refusal to recognize the official rank of third engineer as desired by the Institute of Marine Engineers. The object of the owner is to maintain a supply of cheap officers and engineers. How well he has succeeded as regards the former is well known to engineers, who, profiting by example, are determined to raise their status.—*Nautical Magazine.*

BUFFALO YACHT CLUB.

The annual meeting and election of officers of the Buffalo Yacht Club was held last week. Four amendments to the constitution were brought up to be acted upon at the meeting. The amendments, having in view the abolition of junior memberships, and the establishing of balloting at the annual election by stockholders only, were lost, but it was decided to be a move in the right direction to raise the annual dues to $15, which, hereafter, shall be payable in two installments of $7.50 each, on January 1st and July 1st, respectively. It was agreed that every applicant for membership who subscribes to a $50 share of club stock shall receive immunity from initiation fees and dues for the first year.

The amendment with reference to the raising of the initiation fee was discussed at length. A proposition to make the fee $50 did not meet with the approval of the majority of those present, so a compromise that the initiation fee be placed at $25 was effected. The following officers were elected to serve for the ensuing year. Commodore, Frank B. Hower; vice-commodore, Henry M. Birge; secretary, Howard A. Baker; treasurer, W. C. Cowles; measurer, George S. Hubbell; directors, F. L. Bennett, J. S. Thompson, L. G. Northrup, H. D. Williams, D. E. Morgan, W. H. Heath, N. O. Tiffany; fleet surgeons, E. P. Hussey, Herbert Mickle; regatta committee, J. L. Daniels, G. H. Chisholm, C. Lee Abel.

The reports of the secretary and treasurer were then read and adopted, after which the meeting adjourned.

One hundred and fifty members with a fleet of twenty-four boats and a new club house well advanced toward completion constitute the favorable auspices under which the club is now working.

CARRIER PIGEONS AS MARINE MESSENGERS.

The experiment of putting carrier pigeons on Sable Island, that narrow, low, sandy island lying to the southwest of Cape Canso, N. S., which has been called "the graveyard of the Atlantic," has proved successful. The experiment was tried by the Canadian government as a relief to the islanders, the government steamers making only monthly trips. The homing loft of the birds is at Halifax, nearly 250 miles from the island, and the flight is made over the stretch of sea in less than a day. One pigeon was out in the heavy storm of November 28th, and lost part of its message, but enough was deciphered to show that all were well on the island that morning.

A CRUISE ROUND THE WORLD.

Dr. W. C. Ransome, of South Haven, Mich., is building a schooner with which he will set sail in the spring for a trip around the world. He will go through the Great Lakes to the Atlantic, thence to the Gulf of Mexica and along the coast of South America, visiting places of interest; if considered expedient he will then take the Magellan passage, otherwise go around Cape Horn; thence up the Pacific coast as far north as Alaska; thence to Hawaii and the South Sea Islands, returning via the Red Sea, Suez Canal, and the Mediterranean, visiting all points of interest on the way and collecting curios, objects of interest, sketches and photographs of people and places.

Each person connected with this expedition is to be a party interested in its success and perform such labor as the conditions demand. A few ladies will accompany the expedition as sketchers, photo-artists, and to prepare specimens of natural history, as it is proposed to utilize the boat on its return as a floating museum on the lakes. A correspondent is to write letters for newspapers and collect notes and materials for a book. The vessel will cost $9,000 equipped, and $3,000 more will stock it with goods to trade to the natives.

EXPERIENCES OF ENGINEERS IN THE NAVY.

A correspondent of the *American Machinist* gives the following account of recent experiences of engineers in the naval service, and claim that notwithstanding the great importance of the engineer's work on board ship at the present time, his services are less appreciated now than they were in the early days.

I notice that chief Melville in his report mentions the possibility of an engineer being called from important work "to answer calmly questions regarding the amount of smoke escaping from the funnels."

That this is not an exaggeration the following statement of an actual and recent occurrence will show. The ships, four in number, of the squadron of evolution, were slipping comfortably along at about eight knots speed, being on a long run, when the flag ship signalled the next in line, "Safety—valve—blowing."

The captain, who was on deck at the time, began to think he was learning something, as he had not noticed any sound, but looking up at one of his pipes, sure enough there was a small show of steam. So the chief engineer was summoned: "Mr. Blank, do you need to have your safety valve blowing?"

"That valve is not blowing, sir; the steam pressure is not within thirty pounds of it. That steam you see is from the leaky valve I told you of three weeks ago, as requiring attention, and being a new patent valve, I do not know exactly what is inside of it, and I want plenty of time before me when I start in to overhaul it."

"Well" says the captain, "there is not bunting enough in the fleet to convey that answer, and we have to give it soon; you say the valve is not blowing?" "Yes, sir;" "And the Admiral says it is, and I must not argue with the Admiral with that show of steam at the pipe top."

So the answer went up, "I know it," and the Admiral on his flag ship ordered, "Stop it," and the answer was, "I cannot." Then the Admiral, supposing that some disrespect to his rank, which was only "nickel-plated," or "acting," was intended, ran up the signal, "Commanding officer suspended from duty."

Then at the next port there was a heap of correspondence, and charges and counter charges, during which, as by good luck, this engineer was not involved, he used his time to quietly grind in that offending valve. The fleet and the Navy department were stirred up for six months over this thing, and all because an acting rear-admiral would meddle with trifling affairs; he had learned somewhere that it was not "good form" in the English service to show steam at their pipes.

LITERARY NOTICE.

"The Iron Founder Supplement," a volume of 400 pages, illustrated with 200 engravings, has just been published by John Wiley & Sons, New York. The author is Simpson Bolland, author of "The Iron Founder." It completes the work begun in the other volume. The mixing of cast iron is discussed on lines favorable to an established system of mixing by chemical analysis. Foundry equipment of modern types and the various molding machines are described. Melting in cupolas and reverberatory furnaces occupies a prominent position, being supplemented by an original table of instructions on cupola management. A number of other subjects are treated in a manner more exhaustive than was possible in "The Iron Founder," and the whole content of the volume is made conformable to the most modern practice.

MARITINE PATENTS.

Among the letters patent issued by the United States government during the past week, was one to Clerk Sintz, of Grand Rapids, for a propeller wheel (No. 512,627), for which application was made only last March. The claim is as follows:

Claim.—1. The combination of a rotary shaft, a hub mounted on said shaft, the supports projecting from said hub, a longitudinally slotted case or shell surrounding the shaft and hub and provided with lugs, the propeller blades pivotally mounted on the the supports and provided with slotted lugs, bolts pivotally connecting the lugs, and actuating mechanism for shifting the position of the blades, upon their pivotal supports, substantially as described.

2. The combination of a rotary shaft, a propeller-wheel having reversible blades and a hub provided with pivotal supports for said blades, a longitudinally slotted shell or casing surrounding said shaft and wheel-hub and having direct pivotal connection with the propeller blades, and actuating mechanism for shifting the position of the blades upon their pivotal supports, substantially described.

3. The combination of an engine shaft, a propeller shaft connected with the engine shaft and having a longitudinal movement independent thereof, a propeller wheel having reversible blades and a hub provided with pivotal supports for said blades, a slotted shell or casing surrounding said shaft and hub, pivotal connections between said shell and propeller blades, and mechanism for imparting a longitudinal movement to the propeller shaft and wheel hub to reverse the blades, substantially as described.

4. The combination of a propeller shaft, a hub mounted upon said shaft, a longitudinally slotted shell or casing mounted on the propeller shaft and surrounding said hub, a pair of propeller blades having direct pivotal connection with said shell or casing, blade supports projecting from the hub through the slots of the shell or casing and pivotally connected with said blades, and means for shifting the pivotal connections of the blades to change the position of the blades substantially as described.

James C. Walker, of Waco, Ky., has received protection recognition of an invention for the use of hydraulic power in the propulsion of vessels, (No. 512,591) application for which was filed March 29, 1893. The claim is as follows:

1. The combination in a vessel; of a well or reservoir located in the hold, and a series of drainage tubes leading thereto, and leakage cups arranged about the joints of the exposed bearings and communicating with the drainage tubes, substantially as shown and described.

2. The combination of a vessel having longitudinal pipes with propeller wheels in them, a well or bilge water collector, and a discharge pipe dipping down into the bottom of said well and extending rearward and having an ejector connection with the discharge ends of the propeller pipes substantially as shown and described.

3. The combination with the vessel having longitudinal pipes with propellers in them; of a well for holding bilge water, a ventilating pipe leading therefrom to the stern, and ejector branches leading from the main or propeller pipes into the discharge end of the air pipes to create a suction or draft therein substantially as shown and described.

4. The combination with the vessel having longitudinal pipes with propellers in them; of a well for holding bilge water, a pipe leading therefrom to the bow of the boat and opening above the water line, a second pipe leading from said well to the stern of the boat, and branch pipes from the propeller pipes leading into the discharge end of said rear pipe substantially as shown and described.

Patent No. 512,269, has been issued to Francis A. Bishop, of San Francisco, application having been filed June 26, 1891. Following is the claim:

1. The combination with a suitable case, of a ship's log adapted to be raised and lowered in the case, and a gate for shutting off the water beneath the log when the latter is raised.

2. The combination with a case and a ship's log capable of being raised and lowered therein, of a gate for shutting off the water below the log when the latter is raised and knives connected with the gate and case for severing sea weed or other material between them, substantially as set forth.

WORK ON LAKE ERIE LIGHTS.

Col. Jared A. Smith and his corps of assistants have been busy this winter in carrying out the work for which money has already been appropriated, and in making plans under direction of the Light-House Board. At the new straight channel from Lake Erie into Maumee Bay, some eight miles in length, it has been arranged to assist navigation, not only by the shorter distance necessary to travel, but by other improvements. The doing away with a number of elbows in the channel has made it possible that two ranges, or four lights, shall take the place of seven which it was necessary to keep in service while the old tortuous channel was in use. One range is to be placed about three miles from the end of the dredged channel, and directly in the middle of the channel, with a "turn-out" dredged around it on either side where the channel is over six hundred feet in width. One of these lights is about five hundred feet distant from the other, and one is twenty-five feet higher than the other, as is the case with all range lights. In this instance the range has to be picked up by boats in both directions, and the outer light, which stands the higher, is to be placed upon a rectangular frame work, supported at the corners upon four long cylinders, which are sunk into the bottom a considerable distance, in order to give a good foundation. This allows the lower range light to be seen under the other by vessels to lakeward of the range. On Manhattan Point there are to be placed two range lights, to guide vessels the remainder of the way into port, obviating the necessity of having to depend upon a range in the rear.

For the guidance of boats in the new straight channel at Sandusky, Col. Smith is preparing plans for two lights. When they are in place three other lights at Sandusky may be discontinued.

All preparations have been made for the construction of two range lights on the northern part of Grosse Isle, a short distance above Ballard's Reef. The only reason of delay in beginning construction is the fact that the river has not been frozen over. Col. Smith hoped to put down his foundations through the ice this winter, but if the river does not freeze over it will be impossible to do this work before the opening of navigation. There is another beacon designed and all ready to put up a short distance below the Mamajuda Island light, to form a range with that light for the guidance of boats bound up after they pass the floating light at Ballard's Reef. The two ranges just mentioned as to be put on Grosse Isle are to be picked up by boats on the Mamajuda range in order to take them clear of the shoals below Mamajuda and into the channel between Mamajuda and Fighting Islands. There is a small appropriation for two range lights on a shoal above Grassy Island, intended to be picked up when opposite Grassy Island, but the amount appropriated was not sufficient to place as good an order of lights as are really required there, and there is no provision for a keeper's dwelling. The location of the lights is at a considerable distance from any village, and where keepers live at a distance they are not so reliable. For these reasons the Light-House Board is endeavoring to secure a larger appropriation before beginning any work on these lights.

There are several more lights which congress has not yet authorized, but the Light-House Board will attempt to secure appropriations for them in the sundry civil appropriation bill. One of these is for a range at the head of Grassy Island, which will mark the channel past the head of Fighting Island and up the river nearly as far as the Michigan Central railroad bridge at Detroit. There is another beacon desired at the south end of Grassy Island, to form a range with Grassy Island light in marking the channel from the point where the new Grosse Isle ranges will be dropped, the boats now steering direct for Grassy Island light. The addition of these two ranges would complete the system from Detroit to the Limekilns. A $100,000 appropriation is also to be asked for a lighthouse on Ballard's Reef. A lighthouse is desired on the south end of South Bass, or Put-in-Bay Island to aid in steering clear of Starve Island Reef on the way down, and shoals above Put-in-Bay Island on the up trips, being used in range with Green Island light in one direction, and with Marblehead light in the other. A fog signal is also wanted in connection with this light. A fog signal on Galloo Island, and a lighthouse on Carlton Island, in Lake Ontario near the head of the St. Lawrence river are to be asked for.

A PERCUSSIVE CAULKING TOOL.

At a recent session of the Institution of Engineers and Shipbuilders in Scotland, there was a discussion of a percussive tool, invented by M. J. M. Ross for caulking, chipping, etc. Notes from the experience of Prof. Jamieson, stated that when the tool was handled by an experienced workman it seemed to act more accurately and quicker than a skilled workman with the ordinary engineer's hammer and chisel or caulking tool. Fitted with a diamond pointed chisel the tool ripped a straight line cut along the face of a very tough piece of wrought iron (viz., the head of an old steam hammer piston rod) 6 inches long by about 3-16th inches deep, in 15 seconds. With a flat chisel it chipped from the face of the same tough piece of iron a strip 6 inches by ½ inch broad by ⅛ inch thick in 20 seconds, whereas it took himself nearly 30 seconds to do the same with an ordinary hammer and chisel, and he could not have kept up this speed for over a quarter of an hour. When boring holes through stone it made a round hole of 1 inch diameter and 9 inches long in a block of sandstone, in a minute and a half, with far greater certainty and ease than can be done by a jumper-iron and a hammer. When applied to caulking it raised a clean, deep, firm burr in the iron, which could only have been equalled in time and precision by a first-class workman doing his utmost.

ANOTHER NEW STEEL SHIP.

Reliable advices from Chicago announce that the Chicago Shipbuilding Co. have just closed a contract with Chicago parties for the construction of a new steel steamer of the deep draught type. Work is to be pushed in order that the finished boat may take part in the fall trade of next season. Her dimensions are: Length of keel, 328 feet; beam, 44 feet; depth, 28 feet. She is intended for a bulk freight carrier, but will be constructed with gangways so that she can be placed in the package freight traffic, and will also be very convenient for handling flour, the transportation of which has grown to such great proportions on the lakes. She will be propelled by a triple expansion engine with cylinders respectively 23, 38 and 62 inches in diameter, by 40 inches stroke, and steam will be developed by two boilers 14 feet in diameter by 13 in length. The steamer will be built under the rules and classification of the United States Standard Register of Shipping.

TRAFFIC AT DETRIOT.

The deputy collector of customs at Detroit in his annaul report of freight traffic by railroad across the Detroit river during the year ending Dec. 31, 1893, gives the following totals: East bound—Michigan Central, 123,178 loaded cars, 12,038 local, 10,039 empty; Grand Trunk, 48,154 loaded, 7,267 local, 9.200 empty; Canadian Pacific, 12,286 loaded, 22,295 local, 21,166 empty. Westbound—Michigan Central, 83,746 loaded, 7,150 local, 51,666 empty; Grand Trunk, 32,327 loaded, 3,135 local, 21,856 empty; Canadian Pacific, 5,250 loaded, 1,240 local, 8,398 empty.

This makes a grand total of 227,079 east-bound and 214,768 west-bound cars, which by comparison with the figures of 1892 shows a falling off of about 40,000 cars.

3,656 vessels, with a tonnage of 1,434,265 entered the district port during the year, and 5,874 with a tonnage of 1,480,145 cleared, the total number of entries and clearances being 11,530, and the total tonnage 2,914,410 In 1892 there were 12,288 entries and clearances, with a total tonnage of 2,576,707.

A TORPEDO BOAT CATCHER.

The British firm of Yarrow & Co. have just completed a torpedo boat catcher named the Havock. Under the adverse circumstances of a heavy sea she has developed a mean speed of nearly 27 knots per hour. It has also been proved that she would steam at 10 knots with a consumption of 3½ cwt. of coal, and could thus cover 3,500 knots at that speed without re-coaling.

A NEW SIGNALING DEVICE.

The Shipmasters Association, No. 3 Branch, Chicago, held their weekly meeting Wednesday afternoon, January 10th, for the purpose of discussing the convention which is being held in this city this week and other business matters.

After the meeting had adjourned the members of the association, vessel owners, vessel and insurance agents, government inspectors and the press, inspected a novel electrical device for signaling on steamships, between the officer in command and engineer, which was exhibited by the International Signal Co., a new concern which intends to place the signals on the market, of which the following is a brief description.

One or more boxes are placed in convenient places on the boat for the master's use, and one for the engineer all connected with each other by a single strand of cable wire, which can be placed in any position without injury to it or the boat. Each box is so arranged that any signal now in general use on steamships can be conveyed to the engineer instantly.

When a signal is sent from any box under the captain's control, it operates all, including the engineer's, simultaneously.

The signal is sent by pressure of a small button, one for each signal and marked accordingly, which throws into view in a space for that purpose the signal desired, ringing a bell on the engineer's and captain's boxes. This signal remains displayed until the next one is sent; when that is done, the previous signal automatically disappears and the present one remains displayed until the next is sent.

The engineer is supplied with buttons by which he can signal the captain, "an accident" or "mishap" and "all right." He can also confirm any signal sent him if he so desires, by the pressure of a button which rings the captain's bell but does not disturb the signal, signifying that the engine is working in accordance with the signal sent. There can be no misunderstanding between the captain and engineer, as both receive the same signals always. The bell on the captain's box is so arranged that it cannot ring until the signal has been displayed to the engineer.

In connection with these signals will be placed a register which will record on paper each signal in ink, with the hour and minute sent, thus making a record of a voyage which is far more accurate than the log book, and can be used as conclusive evidence in a law suit resulting from collisions and accidents.

The patent is the invention of R. H. Gruschow, who has spent four years perfecting it. The officers of the company are, H. F. Gruschow, manager; J. C. Pfander, superintendant; F. C. Drager, general agent; all with headquarters in Chicago.

THAT CORK LEG COMPASS DEVIATION.

The story of the accident to the steamer S. E. Peck by running on Bar Point, being caused by the magnetic influence of the iron about the cork leg of the wheelsman, while altogether plausible, does not prove to be true in the case reported. I am told upon the best authority, that the wheelsman with the cork leg had turned into his bunk and another wheelsman, who had the good fortune to have two perfect legs, had taken his trick at the wheel three hours before the accident occurred.

The real cause of the compass deviation was the addition of a new wheel chain and other alterations made on board the steamer after the compass had been adjusted for deviation.

A CONSTANT READER.

The story above referred to received quite a wide circulation around the lakes, and has brought to light another odd situation of the same character. According to the narrator, on one of the trips of the fine steel steamers Castalia down Lake Huron the past season, the second mate reported to Capt. Allen that the compass had suddenly gone wrong; that the needle would swing three or four points to the right or left at intervals, and that because of these erratic movements it had become utterly impossible to steer a course—in fact he had lost track of the course of the steamer altogether. Capt. Allen accompanied the mate to the pilot-house and found matters just as they had been reported. Besides the man at the wheel two lady passengers were in the pilot-house when Capt. Allen entered. Turning to them, after meditating for a moment, he asked if they wore steel corsets. A reply in the affirmative led to a further question as to where they had been, and this elicited the information that the ladies had paid a visit to the engine-room and that while there the engineer had afforded them an opportunity to inspect the dynamo which supplied the electric lights of the steamer. "That settles it; you must get out of here!" next greeted the ears of the ladies, as Capt. Allen opened the door of the pilot-house for their exit. And while they were walking back to the cabin in a maze of surprise and astonishment at Capt. Allen's exhibition of bluff, sailor-like authority, that compass got right down to staid business again and showed the man at the wheel the way with its usual precision. It is hardly necessary to explain that the dynamo had magnetized the steel corsets worn by the ladies, and that thus the corsets became responsible for the crazy race the needle of the compass ran as the wearers moved to and fro in the pilot-house.

THE DETROIT BOAT CLUB HOUSE.

The new house of the Detroit boat club, to be erected on Belle Isle to replace the club house burned last fall, is to cost $15,000 and will be one of the finest boat houses in the country. The first floor will be largely devoted to the boat room, measuring 70x76 feet, with storerooms and a locker room with a capacity for 225 lockers. Here also will be a plunge bath, 24 feet 8 inches in diameter, filling the tower corner. The social rooms occupy the second floor, with a reception room, dining room, kitchen and pantries on the third floor. The Detroit boat club is the oldest organization of its kind in the west, having been in existence since 1836. It has done a great deal for the development of boating on the Detroit river. The club is officered as follows: President, Wm. C. Jupp; vice-president, Frank S. Werneken; secretary, George B. Sheehy; treasurer, Percy D. Dwight; directors, John L. Dexter, Fred D. Standish, Stanley D. McGraw, E. S. Reynolds and Joseph V. Gearing.

The Marine Record,

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ABUSES OF CLEVELAND HARBOR.

At the meeting last Tuesday evening, of the Cleveland Chamber of Commerce, for the discussion of opportunities for municipal government, Col. Jared A. Smith, United States engineer for this district, hit the nail squarely on the head when he called the attention of the members to the shameful uses to which the city puts its own harbor. Col. Smith stated that the river and the water inside the west breakwater basin were so foul from stagnacy and the accumulated sewage poured into them that the men at work on the government dredges engaged in deepening the harbor last summer were several times made violently ill by the nauseating stench. He also stated that while the city prescribed a very moderate distance to which mud and debris dredged from the river should be carried, it was safe to say it was never carried beyond that limit, and he feared it was frequently dropped inside. He outlined the projection of the east breakwater, stating that it would end nearly opposite Muirson street, 1,700 feet from the shore line. When Col. Smith spoke of the manner in which the city abused the harbor made for it by the general government, he was asked by Judge Ingersoll, if the general government was not in a position to protect its own work. Col. Smith replied in the affirmative, but said it would come with a very bad grace if the representative of the general government should be compelled to apply for an injunction against the city to prevent it from filling its own harbor.

It would seem that when the municipal government has its attention called to a matter of this sort, it should certainly receive prompt attention. By making a catch basin of the breakwater basin, the city of Cleveland not only runs the risk of exposing its people to infectious disease, but certainly stands in its own light, both commercially and so far as securing additional appropriations for harbor improvement is concerned. Below we print the resolutions offered by Mr. L. E. Holden, in this connection, and which were referred to the committee on navigation:

"For the purpose of enlarging the dock capacity of the city of Cleveland, so as to hold and preserve the shipping of the lakes which properly belongs to this city, and in order to increase the harbor as a harbor of refuge, and to encourage the general government to extend the breakwater to a suitable distance eastward; and for the purpose of making valuable land where the shallow water on the shore of Lake Erie exists in front of Lake View Park, and to furnish a place where dirt and ashes may be dumped to the advantage of the city and not to the detriment of navigation, and in short, to utilize the lake front belonging to the city to the advantage of all interests in the city both of business and pleasure, be it

"Resolved, That the Chamber of Commerce recommend that Erie street be opened to the lake, and that steps be taken to build a pier out to the line of navigable water as soon as the same is practicable, and that steps be taken looking toward the building of docks from the end of such pier westward along the line of navigable water to the pier on the east side of the mouth of Cuyahoga River.

"Resolved, That the committee on navigation be, and they are hereby directed to confer with the proper city authorities and request them to have surveys and plans made for the building of the pier above contemplated on the line of Erie street into the lake; also that surveys and plans be made for the building of docks from Erie street to the east side of the pier at the mouth of Cuyahoga river, and that estimates be made first for the building of the pier, and second for the building of the dock, and that they be requested to report what legislation, if any, may be required to procure means for completing these improvements."

Now that an agreement has at last been reached as to the proper method, the proper thing is for every owner to take hold and give the plan his heartiest support. There are no doubt some owners who feel that some one of the plans offered in open meeting of the Lake Carriers' Association would have been as good, or better than that adopted. But this is not the time for criticism. The plan has many advantages which will be better appreciated the longer its provisions are studied; and its success is now dependent upon the manner in which it is taken hold of by the owners. The names of four or five of the leading owners at the top will do more than anything else; and owners should not refrain from, nor postpone placing their names under the agreement, from modesty or other motives. The agreement in its formation is provisional unless the requisite number of signatures can be obtained; therefore, there is no danger of any owner signing away his rights and privileges to his own prejudice.

THE association made a happy selection in the choice of Mr. James Corrigan as president of the Lake Carriers' Association. He has never been backward when active work was needed, and as a "hustler" there is hardly his equal in the association. There was a general feeling that his services should receive proper recognition. President Wilson's wise administration and conservative counsel have also been heartily appreciated, and there is no doubt that if the unwritten policy of the association were not hostile to the president serving two successive terms, Capt. Wilson would have had the office placed in his hands "willy nilly" for another year.

IF the newagreement is formed and not lived up to, there will at least be the consolation that those who violate its provisions cannot screen themselves from notice by a careful observer. The report of Secretary Keep, of the Lake Carriers' Association, is sufficient evidence that the value to owners, of the association, cannot be measured. It is yearly increasing in influence and practical usefulness, and it seems that the day is not far distant when membership will be almost indispensable to carriers, of whatever size or trade.

ECONOMY IN THE FIRE HOLD.

In these days of low freight every detail connected with the running expenses of steamboats should be given careful consideration, and it may be to advantage to consider what part the firemen have in this. It is often said that one engineer will get more out of a ship than another, but in general it will be found that the most successful engineer is the one who manages his firemen best. In many cases this is too little realized and the position and comfort of the fireman, either on or off duty, are not given the consideration they deserve. Men may stand the exhausting labor for a day, or even a trip, but are sure to succumb to a continuous drain of their capacity, and then we have poor firing. To illustrate, let us take the case of a boat starting out on her trip. One engineer, the moment he gets full speed from the bridge, pulls his throttle "wide open," and sends the links to the end of their stroke; not a moment is to be lost; forgetful of the fact that although his safety valves are just lifting, his fires are not properly away; the doors were open and the dampers up. The result of his method is that in less than ten minutes he finds the pressure steadily falling. Then the firemen are sworn at; they take to their prickers, pull the fires about, heap on coals, and do what they ought not to do. The harder they work, the less steam they seem to make, until finally they become disheartened, and the upshot is, that instead of carrying 150 or 160 pounds pressure throughout the trip, the engineer has to be satisfied, or dissatisfied, with 130 or 140 pounds. Then the coal is blamed and the men are blamed and there is nothing but grumbling and ill humor all round.

On the other hand, the engineer who really knows his business knows that nothing is more likely to keep good firemen hard at work than success, or to dishearten them than failure, such success or failure being measured by the steam pressure. On starting, therefore, he will give his fires a fair chance to get a start; he will work his engines up by degrees and will work a little slowly for the first few minutes. His reward will be a rise in pressure; then, gradually, always watching the pressure guage, he will give his engines more and more steam, and the result is, he will run over the trip with the safety valve on the point of lifting the whole time.

Such engineers understand not only engines and boilers, but men. When engines are rather short of steam, it is a foolish thing to drain the boilers in the hope that things will be better by-and-bye. If firemen are already working hard and doing their best it is unwise to let them know that their best efforts are useless. A fall of five pounds may be due to want of boiler power and by judicious handling of the engines it may be prevented from getting more. If by hurrying the engines a further drop of five pounds takes place, the chances are it will be followed by a further drop attributable to the relaxed efforts of the disheartened firemen.

The temperature of the fire holds, especially where the boilers are situated at the bottom of the hold, is often needlessly high, in most cases due to the neglect of obvious precautions on the part of owners, builders, or some one who has to do with fitting the boilers in place. Hot air can only get out if cold air gets in to take its place, and to secure this there should be good and sufficient downtake ventilators, in addition to the large opening or grating immediately over the fire hold. Much of the excessive heat is caused by radiation from the ash pits and Furnace doors, some of the latter seeming to be specially constructed to roast the firemen, all these should be properly screened, as well as the smoke box doors and uptakes, the boilers themselves should also be screened off by a bulkhead at the front end, and they as well as all steam pipes should be properly lagged to prevent radiation. Some owners, we are sorry to say, argue that the expense of a few dollars in making things comfortable is waste of money. No statement could be more short sighted. In the hands of the fireman, lies to a great extent the economical utilization of the coal; and the success of the vessel as regards speed is practically in the hands of the neglected fireman, while the difference between really good and poor firing is at least equal to the difference between a triple expansion and a compound engine, as regards the amount of fuel burned. Not half enough care is taken to provide conditions under which they can work to advantage in the firehold and money spent in making these men comfortable, either on or off duty, so that they may do their work with ease and get sufficient rest, is money well spent. R. L.

THE SHIPMASTERS' GRAND LODGE.

The convention of the Shipmasters' Association began proceedings Tuesday morning at the rooms of the Chicago branch, on Market street. The following delegates and officers arrived at the Tremont House, where they were entertained during their stay in Chicago. Capt. Alexander Clark, grand president; Lyman Hunt, grand treasurer, from Buffalo; W. A. Collier, grand financial secretary, Cleveland; delegates E. G. Thorp, Buffalo; W. E. Rice, Port Huron; C. E. Benham, Cleveland; John Cochrane, Milwaukee; George McCullough, Detroit; George A. Shaw, Marine City; John NcNeil, Bay City. The delegates were received by President George Tebo, Past President James Hogan, Secretary Frank B. Higgie, and several other members of the Chicago branch, who escorted them from the Tremont House to the meeting hall, where they went into session at once.

The report of Grand Secretary Collier shows that the past year was the most depressed of any in the history of the organization. For endowment purposes $11,918 was raised, of which $2,340 came from Buffalo, which has the largest membership in the association.

In the evening the captains enjoyed themselves hugely at a grand ball given at the Tremont house. Wednesday was devoted to the choice of officers for the ensuing year. There were several candidates for most of the offices, but the ticket was in the main the same that was elected last year. The election resulted as follows: Grand president, Alexander Clark, Buffalo; grand first vice president, George McCullough; grand second vice president, John Cochrane; grand treasurer, Lyman Hunt; grand secretary, W. A. Collier; grand chaplain, W. E. Rice; grand warden, George Tebo; grand marshal, C. E. Benham; grand sentinel, Charles Weeks.

The newly-elected officers were installed at a short session held Thursday morning, after which the grand lodge adjourned.

The Shipmasters' Association has lost eight members during the year, five of them by shipwreck. Fifty new members were admitted during the year.

Officers of the Toledo lodge, Shipmasters' Association elected recently, are: President, T. C. Herrick; first vice president, William Lever; second vice president, D. Stalker; treasurer, Charles Hubbard; financial secretary, Al. Fitts; recording secretary, E. G. Ashley.

Capt. Ed. Thorp is now at the head of the Buffalo branch of the Shipmasters' Association.

THE DRY DOCK ASSOCIATION.

The annual meeting of the Dry Dock Association of the Great Lakes was held at Milwaukee Wednesday. There were present Geo. L. Quayle, of the Ship Owners' Dry Dock Co., and Frank Wright, of the Cleveland Dry Dock Co.; Edward Gaskin, of the Union Dry Dock Co.; J. E. Davidson, of the Bay City Dry Dock Co.; Thomas E. Miller, of Miller Bros.' Dry Dock; John Fitzgerald, H. J. Mills, of the Mills Dry Dock Co.; W. E. Fitzgerald, of the Milwaukee Dry Dock Co. The dry docks of the American Steel Barge Co., of Superior; of Dunford & Alverson, of Port Huron; and of H. H. & G. Burger, of Manitowoc, were represented by proxy. George E. Quayle, of Cleveland, was chosen president for the year; W. E. Fitzgerald, of Milwaukee, vice president; and H. J. Mills, of Buffalo, secretary and treasurer. The convention adopted the schedule of rates of last year and adjourned.

SAULT CANAL TRAFFIC FOR DECEMBER.

The following statement of traffic through the St. Mary's Falls canal for the month of December, 1893, is divided as follows:

East-bound—Flour, 125,513 barrels; wheat, 1,191,385 bushels; ore, 3,666 net tons; unclassified freight, 4,193 tons; passengers, 10.

West-bound—Manufactured iron, 200 tons; unclassified freight, 1,457 tons; salt, 3,600 barrels.

East-bound freight, net tons, 244; west-bound freight, net tons, 2,197; total, 58,441.

OBITUARY.

Capt. E. J. Purcell died suddenly of apoplexy Friday night, January 12, at Chicago. He was a member of the Shipmasters' Association, Branch 3, Chicago. He had sailed many years on the Lakes, his last command being the steambarge J. C. Suit, and was very much respected for his integrity and uprightness. He leaves a widdow, four sons and two daughters to mourn the loss of a good, loving husband and father. His funeral took place at Calvary Cemetery, under the auspices of the Shipmasters' Association, and was attended by a large number of his old marine friends.

ON THE MESABA RANGE.

A current report that orders had been received to begin work again at the Merritt mines was denied at Duluth the other day by Mr. Hall, who stated that so far as he knew, no time had been fixed for their resumption.

One iron man who was in Duluth a few days ago, expressed a very vigorous opinion, and one that is not common in that region regarding the local and general mining situation. "The trouble with the Duluth mines is that the royalties are too high," said he. "When the leases were made the royalties seemed low enough, and they probably were; but the situation is different now. Have you noticed the action that has been taken down on the Gogebic and Marquette ranges? They have cut royalties right in two, and in some cases a similar reduction has been made in carrying charges by the roads. The result is that the larger of the mines down there are able to continue operations, and they can furnish all the ore that there seems any demand for. In this (Mesaba) district every one seems to want to make as much as possible out of any work that is done, and no concessions of any kind have been made. With all the natural advantages the Mesaba has, the mines cannot be worked at a profit, while down on the lower ranges they desire only to keep their mine open, whether they make anything or not."

The speaker was a mining man who has had experience in the three Lake Superior mining states, and whether he was right or not time will probably show. As yet no steps have been taken looking to any reduction of royalties on the principal Mesaba mines.

MARITIME LAW.

THE BATTLER.

District Court, E. D. Pennsylvania. November 14, 1893.

1. SHIPPING—LIMITATION OF LIABILITY—INTEREST. Owners who surrender a vessel for the purpose of limiting liability cannot be required to add interest on her appraised value from the time the liability was incurred, although they have long delayed the surrender.

2. SAME—GIVING BOND FOR VALUE. Where the owners, instead of turning over the vessel herself, or paying her appraised value into court, elect to give a bond therefor, they may be required to provide for interest until such time as the money is paid.

In Admiralty. Petition by the owners of the steam tug Battler for limitation of liability in respect to the loss of the barges Tonawanda and Wallace. A libel against the tug was sustained June 2, 1893.

Butler, District Judge. The compensation earned by towage and salvage services is not "freight." The claim to have interest added to the appraised value of the vessel from the time of sinking of the barges Tonawanda and Wallace to this date, cannot be sustained. No case is found in which such a claim was allowed, or made. In The City of Norwich, 118 U. S. 492, [6 Sup. Ct. Rep. 1150] and The Benefactor, 103 U. S. 239, there was equal reason for such a claim. The terms of the statute and the rules prescribed in pursuance of it, seem to forbid the demand. Assuming that the owners have not forfeited their rights by delay, as I do at present, (the question not being raised) they are entitled to a discharge on turning over the vessel, or paying her value into court. It is proper, however, that they should provide for the payment of interest on her value until such time as the money is paid, if they prefer to give bond instead of paying at present. I have no doubt of the court's power to require this. It was so decided in Re Harris by the Circuit Court of Appeals (2nd Circuit, 57 Fed. Rep. 243). The petitioners must therefore either turn over the vessel, pay in her appraised value, or enter into stipulation to pay it with interest at such time as it may be required.

WHITE WINGS ON THE BLUE SEA.

At a recent meeting of the Cleveland Yacht Club Mr. Joseph R. Oldham, the well known marine expert and naval architect, read a very valuable and interesting paper entitled "With White Wings Floating on the Deep, Blue Sea," which, while heretofore noticed in THE MARINE RECORD, is worthy of more lengthy mention. The paper is given substantially below, although certain omissions are rendered necessary by the fact that the points in the lecture, for it really was such, which were otherwise not quite clear to the nautical amateur, were illustrated by Mr. Oldham with large diagrams. After a brief introduction, Mr. Oldham said:

"The first of these features demanding consideration are the general dimensions, or rather proportionate dimensions, and for this purpose I quote below the principal measurements of the four yachts which have since the year 1886, competed for the America's cup—so named after that most celebrated American schooner yacht, which crossed the Atlantic ocean and came back with the much coveted trophy (presented for competition by the Royal Yacht squadron) in her possession. I have often heard of the race around the Isle of Wight in a *gale of wind* in the year 1851, when the above named yacht signally defeated fifteen competitors and brought the cup to this country, since which time it has been called the America's cup:

	L.	B.	D.	L–B	
Thistle,.....	86.46	by 20.4	by 13.6	4.238	1887
Valkyrie.....	85.50	by 20.6	by 16.6	4.168	1893
Volunteer.....	85.86	by 23.2	by 10.0	3.701	1887
Vigilant.....	86.12	by 26.0	by 14.0	3.312	1893

"By this you will observe that the most eminent yacht designers appear to hold diverse views as to the ratio of breadth to length and draft to breadth, by which the greatest speed is to be attained. There was a considerable difference between the Thistle and Volunteer with regard to breadth, and there was a still greater difference in their draft of water than there is between the Valkyrie and the Vigilant.

"We see also that the celebrated sail yacht designers have recently largely augmented the breadth of beam and extreme draft of water. This latter increase was a necessary collorary of the form of fin keel, so as to secure the proper ratio of the immersed vertical longitudinal plane, but why the draft of the Volunteer should have been increased 40 per cent. in the design of the Vigilant, and a very deep center plate be also retained, I cannot quite understand, though it may be pointed out that with great breadth and with a low position of the center of gravity as well, form stability and weight is thereby secured. This is an advantage when the center plate is raised. However, we may soon ascertain the correct proportions for such yachts if these contests are continued, and that by the safest of all rules, namely, experience. I have often in this way, as in other matters, found experiment superior to the most approved formulæ.

"It is slightly hazardous to suggest what the exact proportion of length to breadth and breadth to draft of water (extreme) should be, but with this qualification I may say, in a very general way, that for deep keel yachts between one hundred and one hundred and fifty tons displacement, a safe proportion of breadth to length would be as 1 is to 24-100, or, in other words, the length of the water line should be about four times the extreme breadth, or preferably a little less, and the extreme draft may be from 80 to nearly 81-100 of the breadth. I may mention, however, that Mr. Kemp, in his most excellent book, appears to recommend greater length in proportion to breadth, for he says that 'five and one-half beams cannot with advantage be exceeded in yachts above fifty tons.'"

Mr. Oldham here gave an exhaustive demonstration, by means of diagrams, of the influences exerted by the change in a yacht of the center of gravity and the center of buoyancy, and upon the subject of lateral resistance, and continued:

"I need hardly remind you, gentlemen, that there are two schools of thought more or less continuously occupied in the endeavor to determine and demonstrate the quantitative superiority of one of the two systems adopted to obviate lateral movement in a sail boat. One plan is that of the deep keel, or fin keel, the other is to have an adjustable board or plate in the place of a deep keel, this, as you all know, is called a center-board and was first, I believe, adopted in this country by Salem Wines, a boat builder of New York about a century ago, unless it be true that Ptolomeius Philopater, of Egypt, had one in his little yacht which was 420 feet long, 56 feet broad and 75 feet high, for such would have been a very valuable adjunct in the shallow waters of the Nile or Niger, assuming that so very humane a gentleman occasionally considered the comfort of his 2,820 oarsmen by hoisting sails so as to afford them rest and recreation during a long voyage, for the center-plate is the most efficient surface for securing lateral resistance without augmentation of surface friction.

"A boat having a deep keel may have sufficient lateral resistance without additional adjuncts such as centerboards or weatherboards, but a yacht having a broad midship section would certainly not be as weatherly without some extraneous surface judiciously arranged to lessen lee-way when beating to windward, and it is doubtful even with a centerboard whether a shallow broad vessel would make equally good headway on wind in a heavy sea. But notwithstanding all that, the advantages of the broad and shallow model with a centerboard are paramount.

"I must now only touch briefly on the centre of effort, buoyancy, stability and speed.

"According to Mr. Dixon Kemp, it will be found advantageous to place the center of effort a slight distance forward of the center of lateral resistance; this distance, he says, should vary from .01 to .03 per cent. of the length of the lead line. On the other hand, Mr. F. P. Marett says the center of effort should be slightly abaft of the center of the vertical longitudinal plane, though in large vessels it may *pass before it.* The only way in which I can reconcile these diverse views is on the theory that Mr. Kemp includes the surface of the rudder and that Mr. Marett does not take that surface into account when calculating the area of the immersed longitudinal vertical plane.

"In my own practice I place the center of effort and the center of lateral resistance in the same vertical line, for it must be borne in mind that the actual center of effort and the center of lateral resistance, which are calculated as statical pressures will always be some slight distance forward of such centers, for these are resultants of dynamical forces.

"As an instance of a successful yacht, I quote the general particulars of the schooner yacht America, the winner of the America's cup in 1851. She is 87.25 by 22.2 by 8.2 to rabbit of keel. Displacement, 146½ tons in salt water. Her center of effort is 55 feet abaft of the calculated center of lateral resistance. Her sail area is 5,263 square feet.

"With regard to masting cutters, Mr. Fincham proposes that the mast should be placed at one-tenth of the length of the load water line forward of the center of lateral resistance. Mr. Dixon Kemp recommends that the mast be situate 0.4 of the length of the load water line abaft of the fore side of the stem (at that height). There is therefore a great discrepancy between these authorities. I prefer the *basis* by which Mr. Fincham ascertains the center of the mast, but the fraction he uses would place the mast much further aft than is generally approved at this date. If one-fifth be substituted for one-tenth it would be nearer modern practice, but this position should be dependent also on the center of buoyancy and on the calculated position for the center of effort. The mast, I think, should not have any rake-aft, but be upright.

CENTER OF BUOYANCY.

"The longitudinal position of the center of buoyancy is usually expressed in terms of the length of the load water line. that is, the distance the center of buoyancy should be from the center of the length of the load water line as divided by that length; thus the America's center of buoyancy is 4.27 feet abaft of the center of length and

$$\frac{4.27}{87.25} = .049 \text{ feet.}$$

In other words, her center of buoyancy is nearly five per cent. of the length of the load water line abaft of the half length on that line. Now, though a vessel be staunch, weatherly and fast, such merits or essential features would not nearly fulfill the conditions of a good ship if only a doubt were felt concerning her statical stability, which is defined to be the moment of force by which a floating body endeavors to regain its upright position or position of equilibrium after being deflected therefrom, so it may be well to say a word or two on that head.

"The speed of a yacht is largely dependent on her power to carry sail, which, in its turn, is dependent on her statical ability. To calculate the sail area suitable for a certain hull, it is necessary to ascertain the metacentric height, which is the distance between the center of gravity and the metacenter.

"The position of the centre of gravity depends upon the distribution of the weights incorporated into the structure of the hull and on the location and weight of the ballast and equipment. The height of the metacentre depends on the ratio between the surface of the load water plane and the immersed volume of the hull, so you perceive that the metacentric height may be increased, either by lowering the weights of the hull, or by augmenting the breadth and area of the load water plane, which means increasing the surface stability.

"A few years ago, Mr. Martell made a very instructive comparison as to the stability of a yacht like the Volunteer, and one similar to the Thistle, and possibly such a comparison will not be quite uninteresting to some of you to-day. Let me promise however, that this does not hold good between the Vigilant and the Valkyrie, for the former is a deep keel boat with a centerboard added whilst the Volunteer is quite shallow, her draft of water as you may see by the preceding table, being less than half her extreme breadth.

"In British yachting circles, the tendency for some years has been in the direction of decreasing the beam, and to acquire necessary displacement, by increasing the draught.

"The loss of stability initially, and indeed at all inclinations at which yachts usually sail, resulting from decrease of beam, has been compensated in practice by carrying large quantities of ballast, amounting in some instances to more than the weight of the hull, spars and equipment combined. This diminution of breadth has been carried out of late years to an extent, which many experienced yachting men have regarded with disfavor. The tendency, no doubt, has been fostered by the retention in the minds of many of the erroneous ideas upon the subject of resistence prevalent for many years, and which led to the construction of comparatively narrow and unsafe vessels for general mercantile purposes.

"Our knowledge of the resistance of ships, which we owe to the patient investigation of the late Mr. Freude and his son, scant though it be, is sufficient to show that increase of beam is not necessarily associated with increase of resistance. As soon as that fact in connection with other advantages which breadth gives, became sufficiently impressed upon men's minds, a rapid change in the proportions of vessels built for the Mercantile Marine at once took place. The same change, however, has not yet taken place in the design of the British yachts.

"In this country, however, our yacht designers discovered that broad, shallow vessels without artificial means of preventing leeway, were not superior to, if as good as, those having a greater hold of the water. Hence the introduction of the centerboard. Having thus cursorily traced the growth of the two types of yachts, I propose discussing briefly some of the advantages which they independently possess.

"Breadth of beam is essential to initial stiffness, if

stiffness is to be secured by form alone or even by form mainly. The narrow, deep yacht has necessarily a low position of the metacenter and an adequate interval between the metacenter and the center of gravity can only be secured by artificial means, that is to say, by the use of a large quantity of ballast, to lower the center of gravity). The shallow, broad yacht, on the other hand, possesses initial stiffness due to form alone, and although ballast is carried in these vessels also, it is not required to anything like the same extent, and is useful mainly in lengthening out the *range* of stability. As a matter of fact, therefore, the one yacht is able to stand up under her canvas in a breeze with a small amount of ballast by reason of the stability due to her *form*, while the other cannot do so without the aid of a large quantity of ballast.

"As regards this feature of initial stability, which is of the utmost importance in racing yachts, since it practically determines the area of sail to be carried, there is, in my opinion, no doubt that the advantage is on the side of the broad, shallow vessel. Initial stability can be gained more easily and more rapidly by increase of beam than by increase of ballast. The broad yacht can usually carry at the same inclination, in the same breeze, a larger quantity of sail than the narrow, heavily ballasted yacht of the same length and same area of immersed section, or if both be provided with the same spread of sail, she will stand up better under her canvas and thus have her sail area more advantageously disposed for receiving the wind's pressure.

"In estimating the centre of gravity of the vessels, each is assumed to have masts, rigging and sails of the total weight of 10 tons.

"The metacentric height in the Thistle is thus found to be 3.2 feet and that of the Volunteer 4 feet. At all moderate angles of heel the advantage is considerably on the side of the Volunteer. This vessel however, reaches her angle of *maximum* stability at about 28° and beyond this the moment of stability continuously decreases until the angle of about 76° is reached, when the stability vanishes. The Thistle on the other hand, although possessed of less stability at small angles of heel, does not reach her maximum stability until about 55° of inclination is reached, and at 90° she has still a large righting moment. Such a vessel is of course uncapsizeable, while it is questionable whether the Volunteer could be considered safe for an over-sea voyage, subject to the sudden gales which might be encountered, or at least if a race were sailed in the open sea in bad weather, whether it would not be considered prudent or necessary to reduce the sail spread in weather in which the Thistle would carry all her plain sail with perfect safety.

"Perhaps there is no subject on which non-scientific men more frequently deceive themselves than that of the question of speed, either of steamers or sailing yachts. And one point is frequently lost sight of, that is, that certain *length* is necessary to attain a certain speed, so you may take it that no matter how fine the lines may be or how good and large the sails are, great speed cannot be secured by a short vessel. As an illustration of this I quote below the length of water line necessary for a certain speed as observed by Mr. Dixon Kemp.

"In practice, looking at the variety of conditions which have to be fulfilled, it is found that the *maximum* speed attainable by sailing yachts is as the square root of their lenght multiplied by 1.25. This rule is so simple that we may all commit it to memory with but little trouble.

SPEED TABLE.

Length of L. W. L.	Velocity.	Length of L. W. L.	Velocity.
	Knots per hour		Knots per hour
25 feet	6.5	63.3 feet	10.0
30 "	7.0	81.0 "	11.3*
36 "	7.5	100.0 "	13.0
41 "	8.0	121.0 "	13.6
50 "	8.8	136.0 "	15.0

* Speed of Vigilant corresponds to this.

As a further example I quote the yacht Sappho, she is 121 feet by 27 feet 14 inches by 12 feet 8 inches and her average speed for twenty-four consecutive hours was 13.1 knots per hour. Now refer this to the above formula. The square root of 121 is 11 and 11 multiplied by 1.25=13.75, so this yacht would doubtless attain a speed of over 13¾ knots per hour for several hours together to equal such an *average* as the above for one day. She is credited however with a speed of 16 knots per hour for several days in the North Atlantic.

"Now just a word about these recent contests. I will try to be thorougly impartial, remembering always that science has no nationality and has no friends, unless it be truth, accuracy and perseverance. Further, with regard to the drastic changes in these designs it should be remembered that there can be no finality to the advancement of science, and no subject is more scientific than that of driving a ship at great speed over the ocean economically and safely. Yachts, like steamers, designed to be fast sailers, should not be full above water. Such vessels are intended to cut through the waves rather than rise over them, and no enthusiastic yachtsman objects to being the receipient of a little spray. It were better to allow a rising wave to come easily up the bows than to keep it down by "flare."

"It is a meritorious thing to be charitable, and I venture to premise that no class of humanity are more so than maritime men, so let me not be misunderstood in the following remarks.

"Very much has been said and a great deal has been written to make it appear that the British yacht was a superior heavy weather craft, or at any rate, that she could outsail the Vigilant in a gale of wind and heavy sea. That may be so but what of it? Perhaps three yacht races out of every four are sailed in fine weather when at least whole sail may be carried.

"Moreover, a yacht—a pleasure boat—is not required to be essentially a heavy weather craft, or to be at her best, at any rate as to *speed*, when a gale of wind or heavy sea are raging. Perfection under such conditions is more essential to the pilot boat or fishing smack, which frequently are required to perform their most important tasks when the storm is at its height. The ideal pleasure yacht should, of course, be staunch and safe and weatherly, aye, dry if you like in heavy weather, but at such times it is of small moment whether she moves through the water at ten miles per hour or reaches only nine miles. Yachtsmen do not usually spend their 'hours of idleness' in such latitudes as the North Atlantic when the fierce sea rages and the stormy winds do blow. A yacht should also sail fast and be handy in a light breeze.

"Let me now touch on the recent races off New York. I shall only refer to the third race—this was to windward and to leeward. Immediately prior to this race about two tons more ballast was placed on board of the Valkyrie. This increased her length on the load water line about five inches, and this being doubled, the time allowance with which she had been accredited by the Vigilant was reduced from 1.48 to 1.33 minutes. This appears to have been an unfortunate change for the Valkyrie, but perhaps it was more than counterbalanced by the mishap to the Vigilant's centerboard gear, for through this accident it could only be lowered eleven feet while she was on the wind; when off the wind it still projected about five feet and was said to be very unsteady. This was unfortunate for the sloop.

"When the yachts started the wind was moderate and the sea easy. They both carried jib headed topsails over single reefed mainsails, and it was remarked that the Valkyrie would have done better without the reef or minus the extra ballast. It is also added that she pointed fully as high as the Vigilant, and seemed to hold her windward berth easily. When heading into the sea, the result was visible on the Vigilant, as she lost more than in the first hour with the seas abeam, her performance was altogether inferior to the deep keel boat, for in the beat of fifteen miles the Valkyrie had gained just 1 minute 55 seconds on Vigilant, and had a lead of three-eights of a mile when the windward goal was passed.

The speed of the former was at the rate of 7.137 miles per hour, the Vigilant sailed at the rate of 6.99 miles; that is they approached the windward mark at that rate, and of course their speed through the water was largely in excess of this. Both vessels now had some trouble with their sails, but the Valkyrie had the most severe misfortune, for in additiou to the loss of two spinakers, the latter sail fell under and fouled her bow. The wind increased toward the finish of the race, but it was never very strong, for yachts do not carry baloon jibs, topsails and large spinakers in a gale of wind. However that may be, the result of the race was that the Valkyrie gained 1 minute 55 seconds, beating to windward, the Vigilant gained 4 minutes 8 seconds off the wind, thus beating the Valkyrie by 40 seconds.

"Mean speed per hour out or to windward, Valkyrie, 7.137 miles; Vigilant, 6.99.

"Mean speed per hour off the wind or running: Vigilant, 11,83 miles; Valkyrie, 11.22 miles.

"The mean speed per hour out and home was: Vigilant, 8,796 miles; Valkyrie, 8.700 miles.

"I have assumed the distance in a straight line as fifteen miles each way, total thirty miles. It has been stated by a good authority that the Vigilant won this race through being a more powerful boat and carrying more sail, she having about 1,200 feet more sail than the Valkyrie. I take this to mean that the Vigilant was the better boat of the two.

"When I call the Valkyrie a cutter, I make use of the denomination by which such vessels are distinguished in European waters, and which is in consonance with the definition to be found in works of repute on naval architecture and yacht construction. The authors I refer to are Peke, Fincham, Marett and Kemp. Their definition has no reference to model, whether it be of the center-board type, fin keel, broad or narrow beam. The distinction between a schooner, sloop, yawl or cutter is entirely confined to the masts, spars and sails.

"The cutter may be changed into a sloop by adding a fore yard, topsail yard and occasionally a topgallant yard. In the last few lines I am not quoting book learning, but rather the definition or denomination given to the different rigs of one and two masted pleasure boats by yachtsmen, fishermen, pilots and others abroad. Let me preface my further remarks by saying that a yacht designer ought to be an experienced yachtsman, he should feel as much at home by the tiller in a gale of wind, as in the drawing office or mould loft floor. One of the best boat builders I have known was also one of the best sailors of his time.

"A yachtsman should be familiar with the flags of all nations and the commercial code of signals. You who have read the 'Cruise of the Lady Maud,' by W. Clark Russell, will remember how that when the unsophisticated and dissipated Gordie Skipper desired to get a boat from the mail steamer to carry their letters home, he hoisted the ensign upside down, which made a laughing-stock of him and his yacht, as the liner captain was led to suppose that he was being called to quell a muting rather than convey a few harmless dispatches.

"No gentlemen know better than you I am now addressing that the pleasures and benefits resulting from yachting are attended with dangers, but perhaps that is the very charm that attracts the yachtsman and true sportsman to such pursuits,

'For if the paths to danger known
Why danger self is lure alone.'

"How lamentable it is to think, however, of what a small per centage there are of sea-faring men who can swim well, and the per centage of professional sailors or deck hands who can handle a small boat skillfully is perhaps about as small. Is it not an every day paragraph in some marine paper, 'Captain or mate drowned, by the capsizing of the small boat when returning to the ship.' I have lost several good friends in that way. These disasters ought not to happen to men who have safely navigated their ships for perhaps thousands of miles over the ocean, and they would not happen nearly so often if more of our youths were trained as yachtsmen in small open boats. I think it ought to be an essential qualification for mastership of merchant vessels or yachts, that the applicant should be a swimmer and an expert in handling a small boat.

"It would be time well spent, I think, if we all studied how to resuscitate the apparently drowned. I well remember once when a yacht was capsized in the Mersey, how that a friend of mine, after carefully though energetically treating an apparently drowned shipmate, lay in bed with him for several hours in a Rock Ferry hotel and by virtue of his warm body being in close contact with that of our friend's cold and apparently lifeless form, restored him to health and strength again.

"A yachtsman should ascertain the best trim for his yacht by sending men from the taffrail to the bowsprit and vice versa. He should be able to shin up aloft with agility, should be able to take a patent block to pieces, clean and overhaul it. He should understand the rule of the road and the law regulating his side lights, should know the difference between a running and a standing bowline, a clove hitch and two half hitches; a reef knot and a granny knot; also how to use the lead and handle the log line. He should know when the sheet becomes a tack, and he should always inquire when coasting the nature of the bottom, with a view to anchorage.

"All yachtsmen should box the compass, hand reef and steer, tie a reef knot, and work a Turkshead, should learn to scull, should know something about the construction of a yacht and how to handle a calking mallet, and be able to sew sails and splice a rope, should study the glass, watch the sun and the sky and always keep his weather eye lifting; he should be able to cook his dinner and sing a good song.

"Time the yacht in the same breeze with different sails, and note the angle of heel; he should study the tides, especially in bays, for there the tide does not always ebb and flow for six hours each way. Yachtsmen should always be provided with a good jack-knive. You may deem these matters too trivial for your notice, but let me tell you a story. A few years ago a vessel was cast upon a rock bound lee shore on the coast of Sicily. As usual, few if any of the crew were good swimmers, but they had a good boat and took to it just as the vessel was about sinking; the painter, however, was made fast inside and below the rail of the ship, for the men to shin down on, and when the last man, the captain, whom I knew well, had reached the boat and ordered the painter to be cut there was not a knife amongst the whole crew. The vessel then lurched over, carrying the boat with her and all were drowned save one sailor.

"Gentlemen, if I do not weary you, permit me to make a suggestion—an important suggestion it is. I suggest nothing less than that the next cup defender, or cup winnner (for there are several cups still on the other side of the Atlantic which will be on this side of the ocean ere long), should hail from the port of Cleveland. It may be true that we have only twenty-six hundred registered yachts in comparison with some thirty-four hundred owned in Great Britain and Ireland, but I am inclined to think that we have many hundreds of yachts in this country which were not included in last year's American yacht list.

"But be that as it may, bear in mind, gentlemen, that we in this great port have already built some of the best steam and sail yachts in the world, and our steel shipbuilding is far ahead of the coast. Are you satisfied and contented with this great city taking second place for any length of time in maritime matters? Then let us act energetically and show ourselves to be the greatest yachting community, as well as one of the richest and most influential centers of these United States.

"Here, gentlemen, on this very spot, I venture to think, will the center of civilization be located, and that within a measurable lapse of time; here will all that is greatest and grandest in the mechanical sciences and initiative arts be found. For centuries to come you must be supreme, and that without the aid of the sword or the war horse, for we love not war, though we abhor defeat and cannot be reconciled to it. In conclusion let me add that the restless desire we all possess to be "ever reaping something new," is a paramount and permanent reason for having always before us in one form or another, clear delineations of sound natural laws.

"A ship must conform to these laws before she can be a worthy production of our great country. Pardon me for suggesting that such thoughts as these should always pervade our actions. I speak as a foreigner, though actually a full and complete citizen of this mighty commonwealth, that after some of the richest and most powerful European nations of our day have become, through natural decay, little more than a poetical phrase, your descendants will be the great engineers and navigators of the earth (perhaps of the heavens also) the one utilizing our boundless resources of coal and iron to the best advantage, the other transporting the fruits of their productions to the remotest seas."

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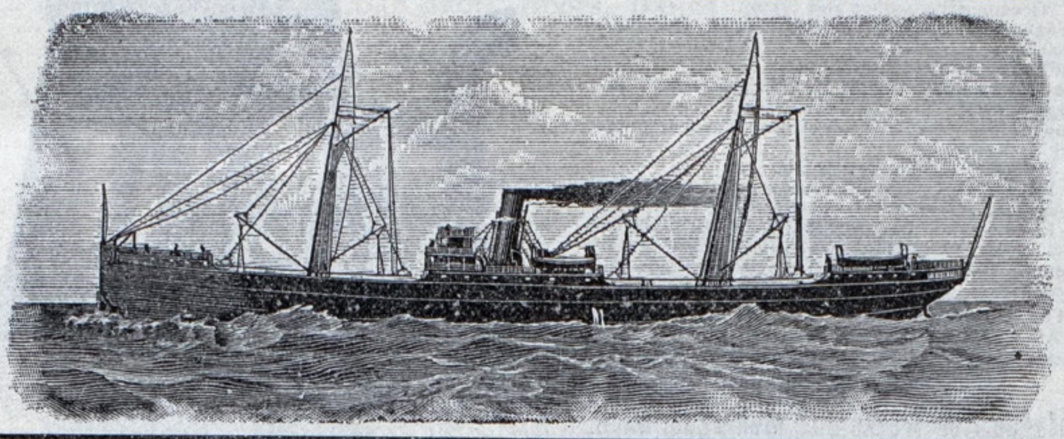

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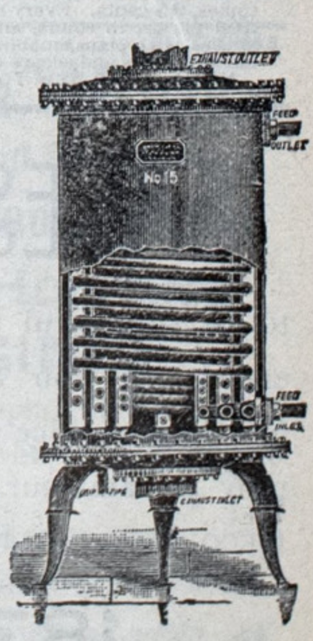

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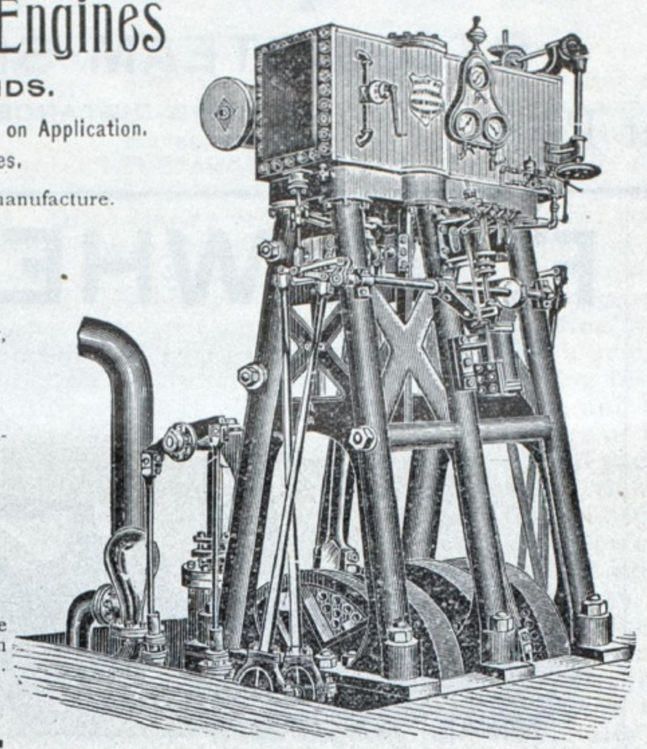

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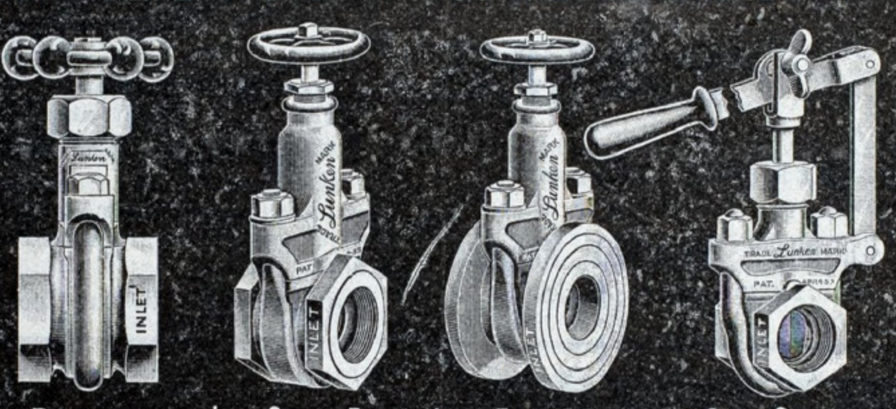

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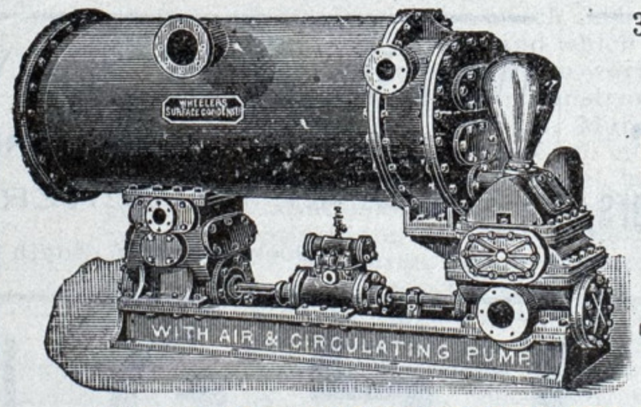

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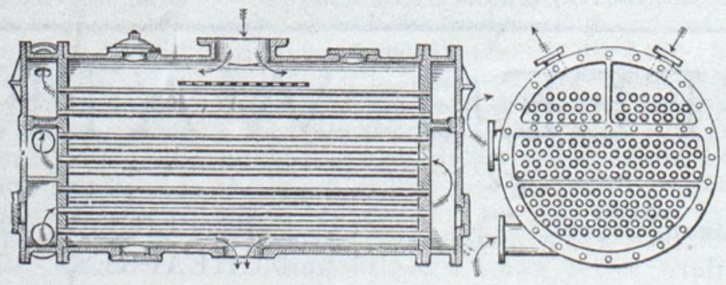

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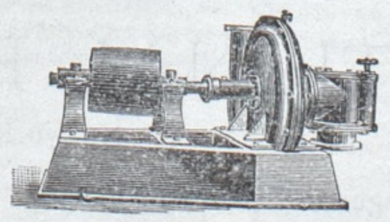

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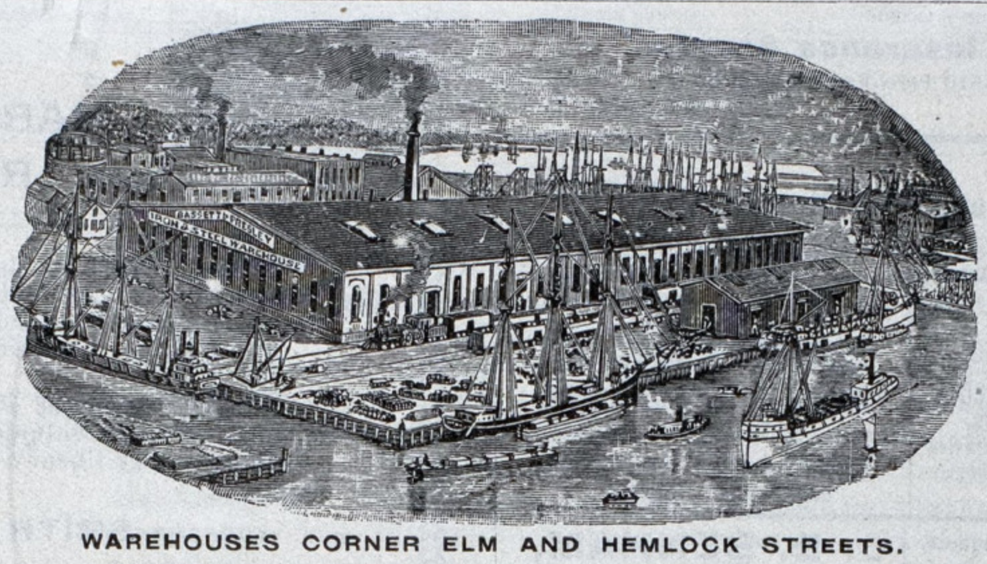

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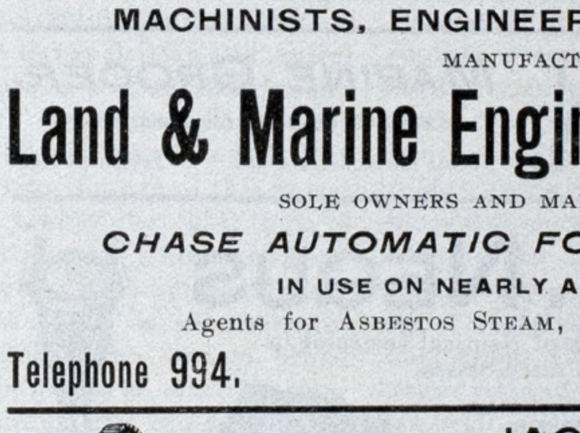

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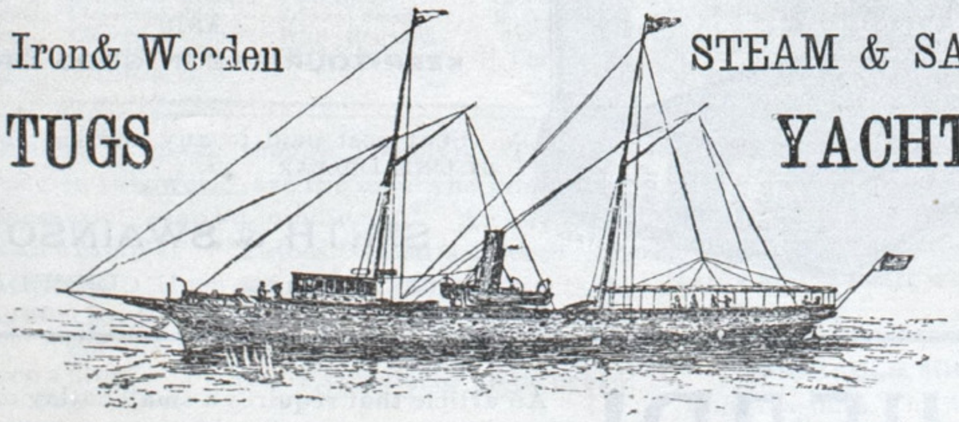

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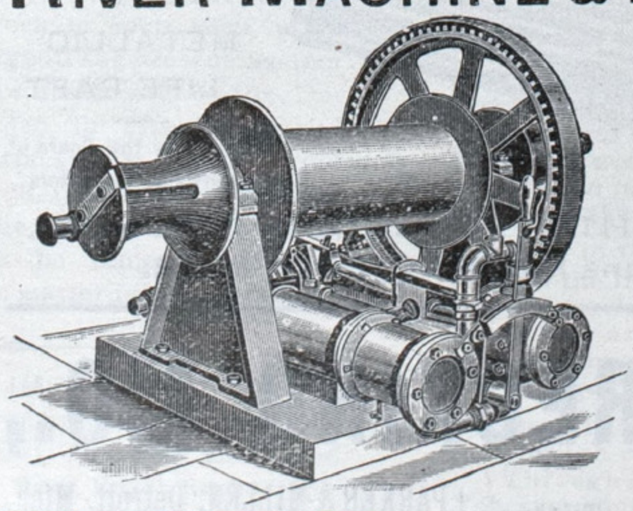

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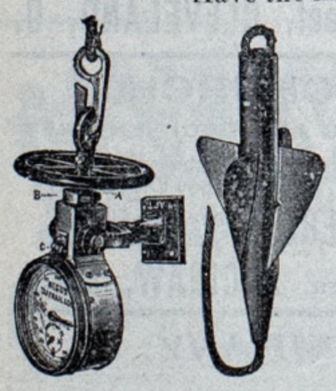

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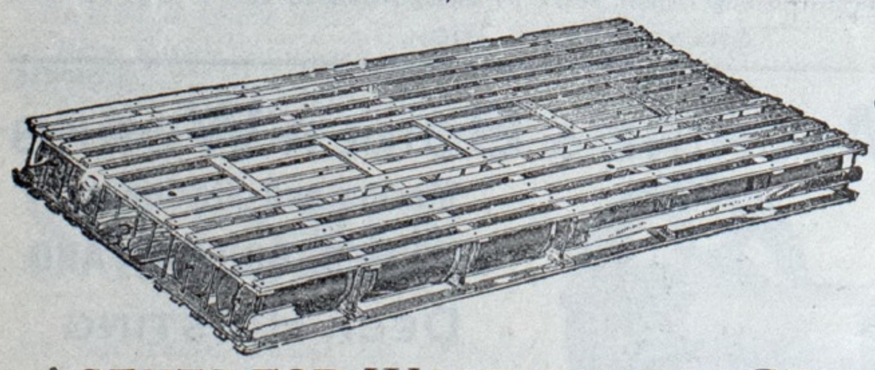

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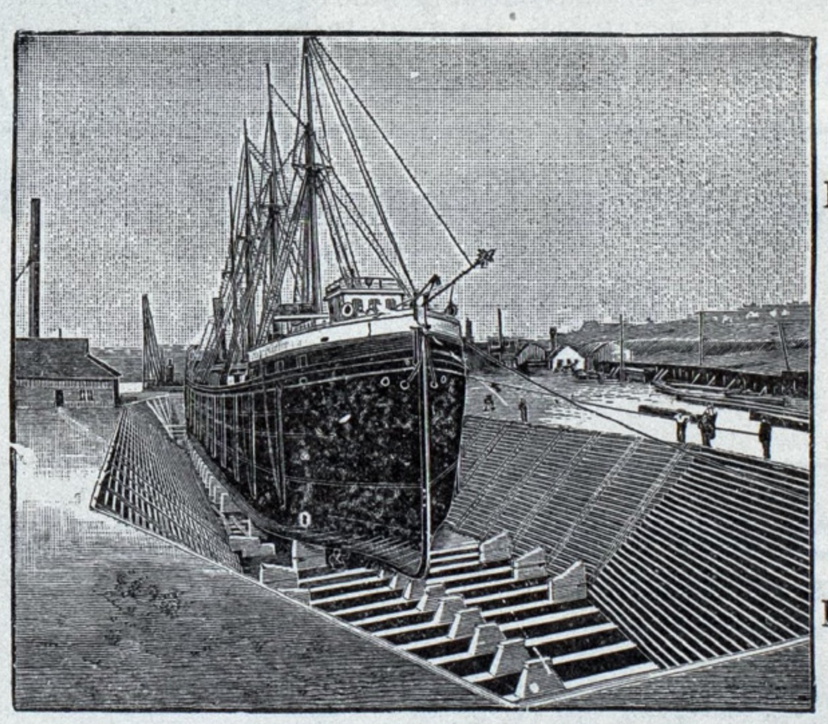

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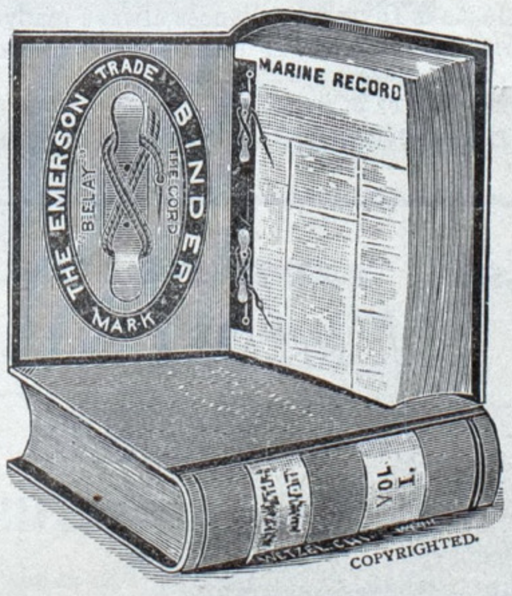

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